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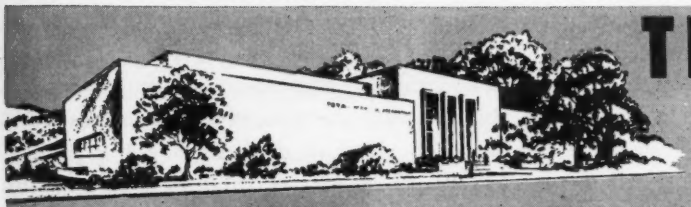

TEXAS State Journal of Medicine

DEVOTED TO THE INTERESTS OF THE MEDICAL PROFESSION AND PUBLIC HEALTH IN TEXAS

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Caduceus at the Crossroads

The threat of sudden massive thermonuclear warfare poses potential medical problems unprecedented. Consider the problem of a city, population 100,000, for example, if it was hit by one Hiroshima-type A-bomb—long since outdated by bigger and more destructive weapons.

There would be at least 40,000 persons wounded to varying degrees, all needing treatment. There would be needed a skilled physician to make the decisions of whom to treat first; whom to treat last; who, if treated immediately, would be useful as, perhaps, a litter bearer; who, if told what to do, could treat himself.

So impossible does the vast and awesome task at first appear that "The mind rebels and tries to turn to immediate and more manageable tasks," as Horton says. "But we cannot shrug this problem off; it refuses to go away."

Widespread apathy, indifference, and unpreparedness predispose to confusion, panic, and hysteria when controlled action and logic are needed. This most certainly augments the promise of early victory for a ruthless aggressor who can be expected to use any weapon, regardless of the consequences. Even the nominal 11 year old A-bomb promptly stopped World War II.

Despite the awfulness of this question proposed for solution—which for sheer magnitude is totally new in the annals of mankind, a note of optimism has been sounded by the bold, energetic faculty of the Army Medical Service at Fort Sam Houston.

These select men of vision from Brooke Army Medical Center, Walter Reed Army Hospital, and other key centers

are working and teaching flexibly and assiduously on every conceivable aspect of catastrophic medicine. Anyone who has attended one of their dynamic courses on "Management of Mass Casualties" comes away with a realization that all of the alarms that have been sounded are not just talk—they are a call for survival. And, above all, one recognizes that the call must be directed to the grass roots doctor, for the boundaries between civilian and military medicine rapidly become less distinct with modern weapons.

There is an urgent need for plans, organization, and the establishing of priorities for treatment in the event of thermonuclear warfare. Your Texas Medical Association and county society have committees for dealing with civil defense, but you yourself must exert leadership and undertake prior planning if you are to survive and function effectively in an emergency and the dozen pair of hands you direct are to do likewise. There is no alternative.

—J. C. DUNLAP, M. D.
Waco, Texas

Thompson Bequests Promote Medical Education

Medical education in Texas—both for the student in medical school and for his practicing elder—received enviable support in bequests of the late Dr. Sam E. Thompson of Kerrville.

Settlement of the estate of the late physician—respected and beloved by the colleagues who had elevated him to the two highest posts the profession of Texas has to offer, President of the Texas Medical Association and chairman of its Board of Trustees—makes available approximately half a million dollars for establishment of the S. E. Thompson Scholarship Fund and $50,000 to the Texas Memorial Medical Library Association. Income from the scholarship fund, left in trust to the Board of Trustees of the Texas Medical Association and the dean of the University of Texas Medical Branch, is to be used "to assist poor and deserving men and women students, citizens of the State of Texas," at the Medical Branch "who without such assistance might not be able to obtain the advantage of a medical education" by loaning them sums not to exceed $3,000 per student at an interest rate not to exceed 4 per cent per annum. Income from the bequest to the Library Association is to be devoted to building up the Memorial Library of the Texas Medical Association, a source of medical information to practicing physicians all over the state.

Dr. Thompson had made no secret of his plans for the Library, promising sometime ago his support of this project after his death as he had supported it by gifts and interest during his lifetime. However, it was not generally known that the bulk of his estate, the remainder after certain specific bequests had been covered, was to be left to aid medical students. The details of this loan fund are yet to be worked out by the trustees, but undoubtedly the fund will make possible a medical career for many young men and women who otherwise would be denied the opportunity to enter this field of service.

With today's clamor for more and well qualified physicians, Dr. Thompson's bequests will serve an admirable purpose.

Principles Remain

Introduction of the Medicare program for dependents of military personnel does not change the obligation of the medical profession to give the best possible care for the lowest reasonable cost. As Dr. Milford O. Rouse has pointed out in his President's Page, Texas doctors have a responsibility to make charges for service under this program—if they choose to participate —that are in keeping with their usual fees; they should not take advantage of a situation that might permit payment of fees in excess of their customary professional charges.

As is explained elsewhere in this *Journal,* the Texas Medical Association, acting in accordance with a directive of the House of Delegates, has entered into an agreement with the Department of Defense to take part in the program authorized by public law to furnish dependents of military personnel certain types of medical and hospital care by private physicians and hospitals at the expense of the government. The agreement includes an allowable schedule of maximum fees (arrived at in negotiations by the Association's representatives after careful study of fees currently charged in the state) which should cover most customary fees satisfactorily. Since it does provide for maximum fees, however, the schedule opens the door for increased fees unless each doctor presenting a statement for payment maintains the integrity of his usual practice in setting charges.

The physicians of this country have been proud of the type of medical service they have provided at total costs that are remarkably low. It would not be in keeping with the traditions of the profession to allow a general upward drift in fees to result from such a program as Medicare, nor should it be forgotten that payments under the program come from public taxation.

Granted that most physicians do not approve the idea behind the Medicare legislation, the law is in effect; the official body of the Texas Medical Association authorized to take such action has voted to cooperate in carrying it out; any individual physician has the prerogative of accepting patients under the program or not, as he chooses; and the program does not change the physician's responsibility to his patient, the public, or himself.

To End the Search

For several years, readers of the *Journal* have had to search at random through its pages for certain of the smaller items of interest. Beginning with this issue, a more complete table of contents, to be published each month on advertising page 5, will simplify that search.

The *Journal* continually strives to give better service to Texas doctors, and it is hoped that an expanded table of contents will be a useful addition.

Yours for the Asking

Officers of county medical societies will be made a splendid offer by the Texas Medical Association in Austin January 26 and 27. On those days, officers who attend the Conference of County Medical Society Officials may learn from one compact program what is expected of them in their new roles, and how they can best carry out their duties. In addition, they may attend the legislative conference and build up their knowledge of medicolegal problems facing the medical profession. They also will be welcome for the Association's first indoctrination program. Although the latter is primarily for new members, it will contain much information which older members might not know.

It is important that county society officials be well informed, both about their local and state organizations and about the broader outlook for the profession as a whole. Young men coming into the Association look to their local officers to answer their day to day questions about its activities. Local newsmen depend on officers of county societies for accurate news stories concerning medical affairs, and concise, accurate answers increase the chances for the right sort of publicity, and therefore for an informed public. Patients and acquaintances, too, want to know just what lies behind a doctor's thinking.

The January conference offers an opportunity for doctors to learn more about their organization. Here, into one week end program, will be packed helpful ideas and information for both new and old members. Furthermore, there will be a chance to exchange ideas with

officers from throughout the state. Knowledge gained at the conference will aid any official in supplying the information and leadership to make his local society rank favorably with the best in Texas.

Councils and committees also will be meeting during that time, as will the Executive Council. The growth of the Memorial Library will be marked by the presentation of the twenty-five thousandth volume—the technical dividing line between large and small medical libraries.

All told, there is much to learn for those who come with that in mind. It is hoped that many will.

★ Current Editorial Comment

Modern Science and An Ancient Art

Medicine as related to the physician, dentist, or nurse is an ingenious blending of two essential ingredients, namely, science and art. The latter of these is not a frill to be tacked on as an afterthought, but is a necessary ingredient which must run through the very warp and woof of medical practice in order to make the whole effective.

The Science of Medicine is that broad river of knowledge fed by the myriads of contributary streams from whose wide expanse men may drink and assuage their collective and individual scientific thirsts. Contributions of the past have become stepping stones of the future, and modern scientists have built upon the findings of past discoveries.

The Art of Medicine, on the other hand, functions in that restricted realm of relationship between the scientist and his beneficiary, the much-discussed and much-misunderstood doctor-patient relationship. This essential attribute of the complete doctor cannot be passed on from generation to generation as blocks of factual data upon which the recipient student may build his scientific research, but rather each neophyte must learn anew its delicate mechanism. As an ingredient, the Art of Medicine augments the therapeutic effectiveness of the Science of Medicine, lending the catalyst of human warmth.

There is substantial evidence that the public relations of the health professions are at a rather low ebb, and there are those who feel that this trend has been closely related to the diminishing proportions of the ingredient of the Art of Medicine. The only permanent and certain technique of developing a high level of mutual respect between the doctors of this nation and the populace at large breaks down to the composite unit of the relationship of one doctor and his patient. If this fails, no amount of public education efforts will succeed.

What are the factors contributing to the gradual decline in the practice of the Art of Medicine? First and foremost, one must consider the rapid growth of medical science itself. When the horizon of medical knowledge widened to the point where no one man could grasp all its details, the natural sequence was the fractionation of this available information to the point of individual comprehension. Concomitant trends were those of fragmentation of the human body into areas of specialist responsibility, all of which were contributing factors to a gradual depersonalizing process.

A second genetic element in the trend toward the impersonalization of the practice of medicine is the philosophy of American education in general, and premedical education in particular. Technical training is being emphasized to the relative exclusion of the liberal

Modified from an address presented to the graduates of the Army Medical Service Officer Orientation Course, Fort Sam Houston, Texas, August 10, 1956, by Dr. Casberg, recently appointed vice-president for medical affairs of the University of Texas.

This department of the Journal *presents editorial comment on current items pertaining to the science, art, and practice of medicine, contributed by members of the Texas Medical Association and others closely associated with the medical profession of Texas. Contributions not to exceed 500 words are invited.*

arts. When carried to its final conclusion, the product of such an educational effort becomes a technician rather than a person of professional caliber.

With the absorption of some 50,000 physicians into the Armed Forces during the war years, the remaining civilian doctors of necessity increased their patient loads to the point where, due to the pressure of time, little opportunity remained for the niceties of medical practice. It is possible that customs initiated by this emergency were never fully relinquished and contribute to impersonal practice. Other factors which may have some bearing are the habit patterns developed by the thousands of doctors who for varying periods of time have practiced in uniform during the past 15 years. Though there is no fundamental reason why a doctor, dentist, or nurse, in uniform is any different from this same person in civilian clothes, there are certain implications associated with the freedom of choice which may create a partial barrier between the parties involved.

Great is the reward reaped by those whose practice of medicine is flavored by the proper blending of the Science and the Art of Medicine. The benefits are twofold: first, and more important, better patient care, and second, a personal sense of gratification on the part of the doctor. To those who have practiced medicine, no reward equals that of sincere patient gratitude and the respect of associates, both lay and professional.

Let us each leaven the loaf of medical practice with the warmth of human interest, the Art of Medicine. Under the pressures of scientific progress, let us not forget that our ultimate mission is the service of man. Dr. Albert Schweitzer once said, "I know not what your destinies will be, but this I do know: those of you who will find real happiness will be those of you who will have sought and found how to serve."

—MELVIN A. CASBERG, M. D.,
Austin, Texas.

Dr. Casberg, University of Texas, Austin.

Coming Texas Medical Association Events in Austin

CONFERENCE OF COUNTY MEDICAL SOCIETY OFFICIALS

10:30 a. m., January 26

Featured Speakers: C. Joseph Stetler, Chicago, Director, Law Department, American Medical Association
Olin Teague, Bryan, Representative in Congress, Sixth District of Texas
Mary D. Cain, Summit, Miss., Editor and Manager, *Summit Sun*

INDOCTRINATION PROGRAM

9:30 a. m., January 26

Medical organization, economics, public relations, legislation, malpractice

LIBRARY PRESENTATIONS

3:50 p. m., January 26

Recognition of growth of Memorial Library and its benefactors

COMMITTEE MEETINGS

January 25-27

EXECUTIVE COUNCIL MEETING

9 a. m., January 27

Details in December and January Journal, Organization Section

President's Page

YOUR PERSONAL HEALTH INVENTORY

You don't have to make resolutions on New Year's Day, but it is an ideal time to take inventory. It is a poor commentary on the medical profession that the life expectancy of physicians is less than that of other male citizens of the United States and that hundreds lose their lives or become physically incapacitated each year from illnesses that might have been prevented or detected enough for effective therapy—if only they had taken time for a thorough physical examination. How can you advise patients to consult you at first evidences of trouble or at regular intervals when you never take proper thought of your own physical well being?

The start of a new year or your birthday is an easily remembered time to have a health inventory. Your associate, or doctor friend down the hall, would feel complimented to be asked to check you over; and you will do him a favor by reminding him of the value of an annual physical examination. If you prefer to go to the nearest medical center, you will find diagnosticians there glad to serve you.

Do yourself and your family a favor by planning now for your personal health inventory!

ETERNAL VIGILANCE IN ORDER!

The beginning in December of participation by Texas physicians in the Medicare plan for dependents of military personnel calls for sober thinking. Doctors did not ask for the law—and by and large disapproved it, feeling that it would be better for Congress to increase the pay of military personnel sufficiently for them to provide medical care for their families by private physicians as their neighbors do.

It is easy to foresee the tendency of some congressmen to seek to expand the principle of medical care of other segments of our population by private physicians and hospitals at the expense of the federal government. Experience of only a few weeks with Medicare already has pointed up some of the inevitable annoyances, unnecessary expense, and possible deterioration of the close rapport characteristic of

private patient and private physician. Texas doctors are trying to cooperate, but are also keeping their eyes open.

Medicare was predicated on the basis of the Defense Department paying the fees prevailing in the community where service is rendered. The Trustees and the Council on Medical Economics of the Texas Medical Association agreed on a schedule of maximum fees that will be allowed—fees that should cover most situations satisfactorily. If a Texas doctor should charge more than his prevailing fee, he will be doing a disservice, because we have an obligation to maintain the highest standards of medical care at the most reasonable cost possible.

Your President has promised to ask the Council on Medical Economics and the Trustees to give the House of Delegates in April a complete summary of the working of Medicare in Texas.

A BILATERAL PROPOSITION

An excellent suggestion has been made by some Houston doctors based on two premises: (1) we are not happy with the implications of Medicare payments; (2) the medical schools of our country need financial support. We can help keep our consciences clear and aid medical education at the same time by giving extra income derived from Medicare to the American Medical Education Foundation or the medical school of our choice. Think it over—then act!

THOROUGH EXPLANATION IS BEST SELLING ARGUMENT

Every Texas physician should be thoroughly familiar now with the plan of group disability insurance available to us, following the recent detailed review of the plan that was distributed.

Check thoroughly your own disability coverage. If it is not sufficient, act now to come in on the Texas Medical Association plan, regarded by insurance men as the most flexible to be secured. Applications are increasing, according to reports from the administrator of our plan.

Milford O. Rouse, MD

ORIGINAL ARTICLES

Present Day Cervix Cancer

HERBERT E. SCHMITZ, M. D., F.A.C.S.

Chicago, Illinois

FOR THE PAST decade and a half there has been an increased interest in the possibilities for treatment in cervix cancers. Increased knowledge of the physics of radiation and the improvement in irradiation technique had established roentgen therapy as the most effective weapon against this type of cancer. The revived popularity of surgery has challenged the status of irradiation therapy. This recent interest has been due principally to the fact that radical pelvic surgery with the aid of transfusions, antibiotics, and improved anesthesia now can be performed almost without mortality.

Dr. Herbert E. Schmitz, professor and chairman, Department of Obstetrics and Gynecology, Stritch School of Medicine of Loyola University, presented this discussion as a refresher course at the 1956 Annual Session of the Texas Medical Association in Galveston, April 23.

Although radical pelvic surgery made possible with transfusions, antibiotics, and improved anesthesia has a place in treatment of radioresistant malignancies, the best basic method for treating the majority of primary cervical cancers remains irradiation. Results in 304 cases of cancer of the cervix treated radiologically and more than 100 treated surgically are reviewed.

Further emphasis was placed on the surgical approach because of the belief that there was a better chance for cure in those cases in which the iliac nodes were involved. It was assumed that cancer cells within the lymph nodes become radioresistant and that this resistance accounted for failures in clinical groups I and II treated with roentgen ray and radium. On this premise, the patient would survive by virtue of lymphadenectomy. I believe this premise is not valid. Morton[7] found positive nodes in 39.3 per cent of a series of carcinomas treated by radical hysterectomy and pelvic lymph node dissection but not irradiated and only 11.4 per cent positive nodes in a group receiving preoperative irradiation. In Meigs'[6] most recent report, the statistics differ from those of Morton. Meigs found lymph node metastasis in 28 per cent of the irradiated patients and a 25 per cent incidence in the nonirradiated group. His end results, however, revealed an 82 per cent five year survival in the stage I and II cases with negative nodes but only a 33 per cent five year survival in those with positive nodes. It seems, therefore, that the original reason for the surgical approach has not proved tenable in the light of end results. Some of these tumors with early metastases to the pelvic lymph nodes are destroyed by irradiation while others, though not destroyed, are effectively entrapped by irradiation fibrosis. The Grahams'[4] work with vaginal smears substantiates this.

The use of nylon tubing with multiple sources of radioactive cobalt as employed by Barnes[2] or the injection of radioactive colloidal gold into the parametrium as utilized by Allen[1] represents an advance in the use of irradiation. Their techniques enable us to deliver higher doses of irradiation to the lateral pelvic wall and may increase the over-all survival rates. For surgery to obtain better results, the dissection of necessity must be more and more extensive and meticulous. This, of course, will increase the number of postoperative complications, especially to the urinary tract. Such difficulties already have been a cause for great concern as demonstrated by Thornton.[9]

One of the original criticisms of irradiation was the occurrence of normal tissue damage produced by the radium and roentgen ray. It was believed that the surgical approach would eliminate such undesirable side effects. I believe that skillfully administered irradiation seldom will cause such injury. Our incidence of fistulas following irradiation therapy at our radiation therapy unit is 1.6 per cent; this is considerably lower than that found in patients treated primarily with surgery.

It also seems illogical to attempt primary surgical removal of a lesion which has extended beyond the cervix into the paracervical tissues. Since surgery in stage II cases is concerned with tissue invaded by carcinoma, dissection of the ureter probably serves only to spread the disease rather than to eradicate it.

Despite the present day controversy then, irradiation seems to be the best basic method of treatment, but surgery is unquestionably a necessary adjunct in

selected cases. To carry this argument to its final conclusion it would be necessary to have a large enough number of cases in two comparable series with an approximately equal number of cases in each stage of the disease to evaluate thoroughly the two forms of therapy. Unfortunately no such report is as yet available.

RESULTS WITH IRRADIATION

We may obtain some idea of the compared results of irradiation and of surgery by reviewing first the five year survival rate for those patients we have treated radiologically (table 1).

TABLE 1.—*End Results of 304 Primary Cases of Cervix Cancer Treated Radiologically, 1933-1949.*

Clinical Group	No. Cases	No. Survivals	% Survivals
I	31	26	83.8
II	75	48	64.0
III	125	50	40.0
IV	73	8	10.9
Total	304	132	43.4

There are 106 cases in groups I and II with a five year survival rate of approximately 70 per cent. These results are close to the 74 per cent five year surgical survival rate of stage I cases reported by Liu and Meigs.[6] It is also possible that some cases listed as stage I and treated radiologically actually may have been stage II, whereas a stage II cancer treated surgically is never included in the stage I series. This point is emphasized by Heyman,[5] who stated that he had not yet found a series of cases treated with primary surgery that had a better end result than a properly treated irradiation group.

There are a group of cases, however, which do lend themselves to sugical consideration. These are the cases in which the primary lesion is determined to be radioresistant subsequent to therapy. In this group, failure to respond to radiation therapy, as demonstrated by repeated biopsies or cytologic studies, together with clinical evidence of failure in the form of progressive infiltration or absence of regression is sufficient indication for surgical intervention. It must be pointed out that this does not mean those cases that have received inadequate irradiation at the time of their initial therapy. In these latter cases, if sufficient time has elapsed, an adequate trial of irradiation therapy will produce a 27 per cent five year survival rate. This is demonstrated in table 2. Our selection of cases for operative intervention is confined to those absolutely radioresistant types. We have also resorted to surgery in cases with complete prolapse of the uterus in groups I and II, in patients refusing radiation therapy, and in cases in which the presence of a large myoma or a complicating adnexal mass precludes the administration of adequate radiation therapy.

TABLE 2.—*End Results of 66 Recurrent Cases of Cervix Cancer Treated Radiologically, 1946-1949.*

Clinical Group	No. Cases	No. Survivals	% Survivals
I	4	1	25.0
II	11	8	72.7
III	18	7	38.8
IV	33	2	6.0
Total	66	18	27.2

Before discussion of the end results and complications in our surgically treated cases, it would be well to review our method of therapy in the usual primary case of cervix cancer. We employ a 50 mg. straight radium capsule (1,500 mg. hours) given at weekly intervals for a total dosage of 4,500 mg. hours. Between radium insertions and subsequently, the patient receives 3,500 r to the midpelvis via the 1,000 kilovolt x-ray. This method will deliver a total of 10,500 r at point A and 4,800 r at point B. This dosage is not cancerocidal in all cases but with the aid of cancerostatic fibrosis will provide acceptable survival rates. We have not resorted to other forms of radium applicators except in selected cases in which there is some unusual growth direction of the tumor. The advocates of colpostats and the various vaginal applicators point out that a higher dosage can be delivered to the lateral pelvic wall by utilizing the vaginal fornices. The risk of normal tissue damage, especially to the ureters, and the realization that end results are actually not better makes the vaginal colpostat impractical.

If the tumor does not respond to irradiation therapy and surgery is contemplated, the patient must be thoroughly evaluated to determine, as far as possible, the extent of the disease. Pelvic examination under anesthesia, cystoscopic examination, proctoscopic examination, and lower bowel roentgen-ray studies are minimal routine preoperative procedures.

RESULTS WITH SURGERY

From 1945 through 1954, 44 radical hysterectomies with pelvic lymphadenectomy were performed. During early 1956, an additional 8 patients were operated on. There were no operative mortalities until 1955, at which time, 1 patient died on the third postoperative day. Autopsy findings revealed myocardial infarction. The three to five year survival rate was 9 of 23 patients (39 per cent).

No discussion of the surgical treatment of cervix cancer would be complete without mention of the

advanced resistant cases. Where the bladder and/or rectum has been invaded, the scope of surgery is tremendously increased. These patients are doomed and only surgery offers some hope for cure. This fact makes the high hospital mortality and low five year survival rate less appalling. It is our belief that as many patients as possible should be afforded an opportunity for cure. If it seems at all feasible to eradicate the tumor, the risk involved should be presented to the patient and the choice should be hers. This viewpoint will do little to improve surgical statistics but may save a greater number of patients.

From 1947 through 1954, we have selected 56 patients as candidates for pelvic exenteration. Four additional cases have been completed in 1956. A few of these patients were selected for other pelvic malignancies, but the majority were operated on for carcinoma of the cervix. None of the cervix cases were treated primarily with radical pelvic surgery. It was possible to complete the contemplated surgery in 37 cases, but in 19 only a palliative procedure was possible. The five year survival rate for our irradiated group IV cervix lesions remains at 10 per cent. Since the primary surgical attack could raise this figure very little, we still believe irradiation is the initial therapy of choice. Our hospital mortality rate for pelvic exenteration is 14 of 37 patients with pelvic malignancy. The difference in hospital deaths between total and partial exenteration is listed in table 3. It can be seen that the posterior exenteration has been more successful in our hands. Similar results have been noted by Brunschwig.[8] The causes of death in the 14 hospital mortalities are listed in table 4. Although the ultimate causes are multiple, it is our impression that badly damaged and infected kidneys are the greatest contributory factors to the high hospital mortality.

TABLE 3.—*Extent of Operation and Hospital Mortality in 37 Cases of Cervix Cancer.*

	No. Cases	No. Deaths	% Deaths
Total exenteration	13	8	61.5
Anterior exenteration	14	5	35.7
Posterior exenteration	10	1	10.0

One of the greatest problems in ultraradical surgery has been finding a satisfactory method of diverting the urinary stream. Parsons'[8] technique of a left transverse colostomy above the ureterosigmoid anastomosis seems to be an excellent solution. This, of course, cannot be employed with the posterior or total exenteration. It is similar to the Bricker pouch but eliminates the prolonged procedure required to isolate a loop of small intestine. It has the advantage of continence as does the Gilchrist pouch but, again, is much simpler and consequently less time consuming. Our experience with the Gilchrist pouch has been somewhat disappointing since the procedure itself has a fairly high mortality rate. We also have had patients in whom the ureter pulled out of the pouch with resulting fistula and ultimate loss of the kidney.

TABLE 4.—*Cause of Hospital Mortality in 14 Cases of Cervix Cancer Treated by Pelvic Exenteration.*

Pulmonary embolus	1
Peritonitis	1
Hepatitis	1
Hepatorenal syndrome	1
Uncontrolable oozing postoperatively	1
Massive hemorrhage due to necrosis of iliac vessel	1
Pneumonia	1
Pyelonephritis	2
Anesthetic death	2
Cardiac failure	1
Surgical shock	1
Uremia	1

Cutaneous ureterostomies are definitely unsatisfactory. They are difficult for the patient to manage. In addition, the os tends to become stenosed, and bouts of pyelitis are frequent. The wet colostomy is not much better. Kidney infection has been the greatest cause of difficulty. One patient died approximately a year postoperatively from a fulminating pyelonephritis. She was free of disease. A second patient died eight and one-half months following surgery because of uremia. Her damaged kidneys, with ureters implanted into the colon, could not withstand the repeated assaults of a bacterial pyelitis.

We have 16 cases of cervix cancer operated upon two years ago or more (table 5). The causes of hospital deaths have been listed. Of those patients leaving the hospital, 2 died of recurrent disease within one year of surgery. Two others died of extensive kidney damage. These results are far from encouraging, but the fact that a few of these hopeless patients have returned to productive lives makes further endeavor and improvement in this line imperative.

TABLE 5.—*Survival Following Pelvic Exenteration for Carcinoma of the Cervix (16 Patients Operated Upon Two Years Ago or More).*

Hospital deaths	10
Lived less than 2 years	4
Lived more than 2 years (dead)	0
Living 2 to 7½ years	2*

*Eight patients operated upon 5 to 7½ years ago with 25% survival.

Lastly, mention should be made of those surgical procedures which are entirely palliative. With extension of the disease into the urinary tract, fistulas, infection, uremia, and ultimate death intervene. In an attempt to overcome these complications and to maintain renal function, a diversion of the urinary stream is sometimes undertaken.

A similar situation arises when invasion produces rectal and intestinal fistulas with the possibility of peritoneal contamination through leakage or obstruction. Colostomy performed as a palliative measure may be beneficial both physically and mentally, enabling the patient to carry on moderate activities for a variable period of time.

When sacral nerve involvement produces severe persistent pain with resultant drug addiction, the services of a neurosurgeon may be employed. Performing a cordotomy will relieve the pain and make living more tolerable.

Ligation of the internal iliac arteries offers another form of palliative intervention. Massive vaginal hemorrhage is sometimes controlled by this procedure and, on occasion, it decreases the rate of growth of the malignancy.

SUMMARY

Our management of cervix cancer is based on the findings and reasons mentioned. Radiation still remains the best available method for treating the majority of primary cervix lesions. The surgical treatment has not bettered the over-all end results. Radical hysterectomy and lymph node dissection does have an established position in the therapy of radioresistant malignancies. The operative mortality is low and the survival rates are encouraging. The status of pelvic exenteration has not yet been fully determined. The mortality rate is alarmingly high, but with increased experience and improved techniques a more hopeful outlook may be available to these unfortunate patients with far advanced disease.

REFERENCES

1. Allen, W. M.; Sherman, A. I.; and Arneson, A. N.: Carcinoma of Cervix: Results Obtained from Irradiation of Parametrium with Radioactive Colloidal Gold, Am. J. Obst. & Gynec. 68:1433-1446 (Dec.) 1954.
2. Barnes, A. C.: Therapy of Lateral Pelvic Nodes in Cervical Carcinoma, Am. J. Obst. & Gynec. 68:489-493 (July) 1954.
3. Brunschwig, A.: What Can Surgery Accomplish in Recurrent Carcinoma of Cervix? Am. J. Obst. & Gynec. 68:776-780 (Sept.) 1954.
4. Graham, J. B., and Graham, R. M.: Curability of Regional Lymph Node Metastases in Cancer of Uterine Cervix, Surg., Gynec. & Obst. 100:149-155 (Feb.) 1955.
5. Heyman, J.: Improvement of Results in Treatment of Uterine Cancer, J.A.M.A. 135:412-416 (Oct. 18) 1947.
6. Liu, W., and Meigs, J. V.: Radical Hysterectomy and Pelvic Lymphadenectomy, Am. J. Obst. & Gynec. 69:1-32 (Jan.) 1955.
7. Morton, D. G.: Surgical Treatment of Cervical Cancer; Wertheim Operation; Pelvic Lymphadenectomy, Am. J. Roentgenol. 57: 685-696 (June) 1947.
8. Parsons, L., and Taymor, M.: Longevity Following Pelvic Exenteration for Carcinoma of Cervix, Am. J. Obst. & Gynec. 70:774-785 (Oct.) 1955.
9. Thornton, W. N., Jr.: Late Urinary System Complications Following Radical Hysterectomy for Carcinoma of Cervix, Am. J. Obst. & Gynec. 67:867-882 (April) 1954.

♦ Dr. Schmitz, Department of Obstetrics and Gynecology, Stritch School of Medicine, Loyola University, Chicago.

Therapy of Carcinoma Of the Breast

J. T. MALLAMS, M. D., and J. E. MILLER, M. D.

Dallas, Texas

MORE has been written about carcinoma of the breast in the past 10 years than about any other malignant neoplasm. This is proper, as it ranks first in the United States in the number of deaths from neoplasm. In evaluating the recent literature, one becomes acutely aware of contradiction and resulting confusion. This is to be expected when one is evaluating disease as insidious and variable as mammary carcinoma. It must be remembered that most persons with this disease will not be treated by large centers, but rather at the local or regional level. It is important then to extract from this maze of statistics the outstanding features of each series, compare and evaluate them, and arrive at some reasonably consistent approach to this problem. This presentation is an attempt to outline one approach, incorporating as many of the desirable features as possible.

Dr. J. T. Mallams and his coauthor are associated with the Charles A. Sammons Irradiation Therapy Center, Baylor University Hospital, Dallas. This paper is a combination of two presented before the Texas Medical Association's Section on Radiology in Galveston, April 24, 1956.

The authors advocate thorough evaluation of mammary carcinoma by the surgeon, radiotherapist, pathologist, and internist. In stages 1 and 2, they recommend radical mastectomy followed by irradiation. Stage 3 may be treated by simple mastectomy and irradiation or irradiation alone. When distant metastases are present, a succession of the palliative modalities available should be used.

LOCALIZED OR REGIONAL DISEASE

The curves of survival for treated versus untreated patients are somewhat parallel, but the survival rate for treated patients is significantly higher than for

the untreated.[6] It seems trite to say that we as physicians are duty bound to treat patients with this disease.

There are two groups of statistics which should be studied closely, as these appear rather important to any decision concerning management. The first is that of McWhirter,[4] who reported a large series of inoperable cases without distant metastases (essentially stage 3) with a five year survival rate of 29 per cent following simple mastectomy and irradiation. This must be compared with other large series using various approaches, most of which have shown 15 to 18 per cent survival.[7] This seems to indicate that adequate irradiation has offered a definite improvement in the survival rates. McWhirter's statistics certainly debunk many of the previous reports indicating no effect with irradiation and show that these results are apparently based on selection of poor cases and low tumor dosages. Either one believes in irradiation, or one doesn't. There is little room for inbetween thinking and applying irradiation only to those who have the poorest prognosis.

Haagensen and Stout[2] on two occasions have demonstrated that radical mastectomy is a two edged sword—its one edge curing and increasing survivals and its other actually decreasing survivals. By their criteria, questionably or definitely inoperable patients subjected to radical mastectomy repeatedly showed decreased survival when compared with similar groups not operated upon but offered the benefit of other forms of therapy. In addition, no cases in this group were cured by the operation. It seems then that some criteria of operability should be established and strictly adhered to. This is best achieved when the surgeon, the radiotherapist, and if possible the pathologist see all patients originally and discuss definitive therapy. A minimal work-up should include chest and bone survey films to make a reasonable attempt to rule out distant disease. Fewer patients will be subjected needlessly to radical surgery when this program is carried out before definitive therapy.

The average general surgeon who sees 10 cases per year would have to practice 15 years before he would have 100 cases with five year follow-ups, and 20 years for the same number of cases with 10 year follow-ups. Then, too, 100 cases is a small number on which to evaluate results. It would seem then that evaluating one's own experience in this disease is probably inferior to using the results obtained in large institutions where many hundreds of cases are well studied and well followed. Therefore, we have accepted the work of Haagensen and Stout[2] in reference to the criteria of operability because of their large series, consistency of technique, outstanding pathologic workup, and adequate follow-up. Their criteria of inoperability are as follows:

1. Extensive edema of skin over breast.
2. Satellite nodules in skin over breast.
3. Intercostal or parasternal tumor nodules.
4. Edema of the arm.
5. Proven supraclavicular metastases.
6. Inflammatory type carcinoma.
7. Distant metastases present.
8. Presence of any two of the following:
   a. Ulceration of skin.
   b. Edema of skin of breast limited to less than one-third of the breast.
   c. Solid fixation of tumor to the chest wall.
   d. Axillary nodes measuring 2.5 cm. or more in transverse diameter proven to contain metastases.
   e. Fixation of axillary nodes to the skin or deep structures of the axilla.

In following out these criteria no patient is denied the benefit of cure, yet none is subjected to a useless and possibly harmful procedure.

Since McWhirter's methods have not improved upon the results with radical mastectomy, that procedure still should be the approach of choice provided the complications are not many and satisfactory criteria of operability are observed to protect those patients who might be harmed rather than helped by the procedure.

Taking all of these facts into consideration, radical mastectomy plus adequate irradiation for operable cases theoretically should give the best results. Inoperable cases probably are handled best by the true McWhirter approach of simple mastectomy plus irradiation when this is feasible.

In terms of irradiation therapy, the dosage should be sufficiently high to get the desired effect. It is true that no absolute figures have been established, but McWhirter's dosages of 3,750 in three weeks delivered to the tumor bearing areas of chest wall, axilla and supraclavicular and ipsilateral internal mammary nodes should be taken as a minimum base line because of his results utilizing this dosage range. It must be remembered that this dosage may not be quite as effective in terms of biologic response in the presence of a decrease in vascular bed following radical resection, but this remains for further evaluation. In addition, this dosage can be given without significant complication following radical mastectomy if properly planned and carried out. As McWhirter has pointed out, it is necessary that one utilize at least a 250 kilovolt machine with sufficient filtration to achieve a half-value layer of 3.5 mm. of copper or more in order to get these dosages. On occasion one will have to increase the target skin distance to some 80 cm. in order to achieve this, even with this half-value layer, to prevent severe skin reaction.

One might ask, "Why use irradiation when the axilla is negative?" There are several good reasons for this. First, in the pathologic stage 1 group, the survival rate is between 70 and 80 per cent in the first five years but drops significantly to approxi-

mately 50 per cent in 10 years, which indicates that there is disease beyond the breast in a large percentage of cases. The second factor is the pathologic study of the axillary contents following resection. This varies from taking one or two sections to the so-called clearing technique. It has been shown several times that the more extensive the sectioning of a specimen, the higher the incidence of positive findings in the axilla. The exact procedure that is done in any one institution, however, must be limited by the ability to do a reasonably extensive job. Past series by outstanding men have shown 33 per cent positive findings on restudy of previously reported negative examinations by the same pathologists.[5] These two facts certainly are in favor of the addition of irradiation, even in those cases with negative axillary findings.

We have applied this approach to a significant number of patients with a minimal complication rate.

DISTANT DISEASE

Every physician, no matter what branch of medicine he pursues, will see patients with incurable neoplasm and may be expected to care for these patients to the end. This discussion will outline the use of existing knowledge in the delaying action which retards the growth of incurable carcinoma of the breast. Palliative therapy of carcinoma of the breast requires planned rather than haphazard, application of known methods of treatment, and planning should be done with a definite intent before treatment is embarked upon. The simple presence of neoplasm does not mean that therapy is necessary. In fact it may not be desirable. Because there are so many different modalities of therapy available, it is necessary to apply a method at a time it is most needed and most likely to succeed. This will give the patient the most relief for the maximum period of time. All of the procedures to be mentioned are self-limited in action, producing different degrees of palliation for varied lengths of time.

Therapy may be defined as the privilege of the physician to help cure occasionally and to comfort always. The measure of the physician is his willingness and ability to comfort. Since most people with malignant neoplasm will die of that neoplasm, the incurable cancer patient becomes a problem of some magnitude. If there is ever a situation in which the art of medicine is more important than the science, the care of a cancer patient should be it. This may sound simple, but physicians who have this ability do not come by it automatically, and some never achieve it. The physician who cares for a patient with incurable carcinoma of the breast must have a liking for and an interest in patients. It is not uncommon for the patient's courage and hope to exceed that of the physician. It frequently is difficult for a patient to find a physician who will treat him. Many patients who have incurable cancer are not seeking a physician to cure them, but are looking for a physician who will treat them. These unhappy people may realize that there is no cure for them if the physician has told them so. There are physicians who will say, "I am sorry, there is nothing else I can do for you. There is no use for you to come back to see me." These physicians rob the patients of hope, and it is never true that nothing else can be done for the patient.

The physician who knows that he cannot keep the patient from dying should strive to help him live. Some physicians feel frustrated because they cannot cure everyone. These incurables emphasize the physician's lack of omnipotence. An unconscious attempt to get incurables off one's hands indicates that the physician does not know how, or is unwilling, to treat sick people. If patients are well cared for in this terminal phase by a compassionate and understanding physician, quackery will perish.

The most significant contribution of irradiation therapy in this group of patients is in the management of bone pain from metastatic disease. This therapy is indicated on the basis of good clinical information even without radiographic evidence. Control of pain in early skeletal involvement is the rule rather than the exception. Retention of bone structure and weight bearing parts is certainly important as it may spare the patient a crippling disorder. As multiple areas of bone metastases occur, it becomes more difficult to control them by local irradiation to small zones. Under these circumstances some general type of approach is more desirable. Total body irradiation either by roentgen therapy or by the use of one of the isotopes is a useful and valid procedure.

In the past two years we have had a rather extensive experience with the use of radioactive phosphorus in conjunction with castration and the use of testosterone. We have followed the method described by Dr. J. R. Maxfield, Jr.[3] We have been reasonably conservative with this technique and have not seen fit to extend the dosage of radioactive phosphorus to the 15 to 20 millicuries used by Friedell and Storaasli,[1] but have used a maximum dose of 12 millicuries given over a period of approximately 10 days. This procedure is promising and helpful in the control of multiple areas of bone pain and in restoring structure to multiple areas of impending or true collapse. Low-Beer has thought that this procedure might slow down the rate of growth of the multiple sites of distant metastases to such an extent that he saw fit to recommend giving radioactive phosphorus to all women who are victims of carcinoma of the breast regardless of the stage of development. This is a rather extreme approach.

Skin manifestations of residual disease at the op-

erative site may occur in as many as 15 to 20 per cent of the patients. Although they do not indicate that disease is incurable, they are present more frequently in patients with evidence of distant metastases. The small skin nodules may be treated by either surgical excision, large doses of low voltage irradiation, or radium needle implant. With a greater number of nodules one may desire to treat the entire area with tangential breast fields with a dosage as high as the skin will tolerate using a minimum of 3,750 volts.

Castration may be beneficial in postmenopausal as well as in premenopausal women. For as long as 10 years after cessation of menses, the ovaries may secrete a significant amount of estrogen. Surgical or irradiation castration of these areas may be of some benefit to this older age group. From 25 to 35 per cent of women will receive objective as well as subjective benefit from castration. We prefer irradiation castration since it is relatively inexpensive and does not discommode the patient to any significant degree. There is not the hazard of laparotomy. There is some divergence of opinion as to when castration is indicated. There are some who will castrate all women with primary carcinoma, regardless of the extent of the disease. It is not possible to prove that this will accomplish anything that cannot be accomplished later when castration is clinically indicated. If this were carried out in all women, many women would be castrated unnecessarily.

The use of testosterone, followed by castration, is an important modality especially in the presence of osteoclastic bone metastases. It is indicated when the metastases are general and no longer can be adequately controlled with local irradiation. Patients may be carried in relative comfort for as long as six months to a year with a maintenance dose of 100 mg. of testosterone given intramuscularly after the initial build-up. The only indication we have used for administration of estrogenic hormones has been in women well past the menopause who have soft part metastases. The benefits of this procedure have been relatively few, although regression of en-cuirasse lesions has been observed on occasion.

The use of radioactive gold and radioactive chromic phosphate intrapleurally will reduce some pleural effusions due to metastases. These isotopes have been more effective where the effusions are the result of metastases from breast carcinoma than from other primary lesions. We prefer to use chromic phosphate rather than radioactive gold because of the simplicity of handling the material. Physicians need to learn more about these procedures so they can evaluate them properly and advise their patients who may benefit from them. Since many methods of therapy are available, the physician's problem is the selection of a specific method of therapy at the time when that procedure should be performed.

The patient who has responded well to other methods of hormone therapy is more likely to benefit from the ultimate procedure of adrenalectomy or hypophysectomy. It also is true that the use of these procedures should be in an orderly fashion. Although this may be the general rule, enough information about adrenalectomy and hypophysectomy is not available to preclude their use where one has not been successful with the other methods of hormone therapy. One of the most spectacular recoveries we have ever seen was following adrenalectomy and oophorectomy. This patient was active and doing well one year following this unusual recovery. We have seen only 3 patients following hypophysectomy, and we believe this procedure holds promise in a limited number of patients.

Regional anesthesia, drug therapy, and neurosurgical procedures such as chordotomy are important measures to be used in the over-all care of patients with incurable carcinoma of the breast. The use of regional anesthesia and neurosurgical procedures is limited to a very small group in whom there is specific indication for them. Drug therapy in terms of pain relief and feeling of well being should not be left to chance and should be controlled by a single physician. Whoever assumes the responsibility for the care of the patient should direct this medication. Enough analgesic should be used to relieve pain. The patient should be reassured concerning her fears of addiction and leave this responsibility to the physician. Drug therapy no less than irradiation therapy requires personal attention and reappraisal from time to time so that it may be adjusted to the needs of the individual.

Supportive therapy is extremely important, especially the therapy of anemia. With neoplasm as well as irradiation destroying the blood forming organs, failure of blood production may be the direct cause of death. Blood transfusions may be indicated more often than we realize. Supportive appliances to bones that may fracture, or may be ready to fracture and compromise the patient's life, may be helpful and indeed indicated. Specific recommendations for diet should not be left to the patient, but rather given by the physician with due indication.

Regardless how one may define terminal illness, the physician must employ all methods at his disposal to see that the patient passes through it with the least physical and mental discomfort possible.

The program with frequent consultation between surgeon, radiotherapist, pathologist, and internist provides the patient with the best possible care. In the patient with localized or regional disease, consultation between surgeon, radiotherapist, and pathologist, seeing the patient before definitive therapy, discussing the pros and cons of various criteria, deciding

upon the best approach, and then carrying that approach out to suit the needs of the patient, will afford the patient the best chance of long survival.

RECOMMENDED APPROACH

On the basis of the information presented, the following is submitted as one approach for the management of mammary carcinoma:

Stages 1 and 2 (limits defined by Haagensen and Stout's criteria of operability, negative chest and roentgen-ray bone survey).

1. Classical radical mastectomy should be followed by postoperative irradiation therapy with the McWhirter technique.

Stages 3 and 4:

1. Without evidence of distant metastases, simple mastectomy should be performed where this can be achieved without cutting across gross tumor (this type of approach is contraindicated in lesions extending through the tail of the breast region). This should be followed by the typical McWhirter type postoperative irradiation therapy.[6]
2. In the cases where simple mastectomy is not feasible, the McWhirter irradiation technique can be carried out with the intact breast, and in selective cases followed by radium implant to the primary lesion.
3. Patients with distant disease should look to one physician who will manage its course and who will handle them with compassionate understanding to the best of his ability. The various modalities available for the care of the patient with distant metastases should be used in a planned ascending fashion, with a definite intent in mind.
4. Consultation of surgeon, radiotherapist, and pathologist before definitive care utilizing proper work-up to rule out distant metastases affords the patient the best possibility for long term results.

REFERENCES

1. Friedell, H. L., and Storaasli, J. P.: Use of Radioactive Phosphorus in Treatment of Carcinoma of Breast with Wide Spread Metastases to Bone, Am. J. Roentgenol. 64:559-575 (Oct.) 1950.
2. Haagensen, C. D., and Stout, A. P.: Carcinoma of Breast; Results of Treatment, 1935-1942, Ann. Surg. 134:151-172 (Aug.) 1951.
3. Maxfield, J. R., Jr., and Maxfield, J. G. S.: Clinical Uses of Radioactive Isotopes, Texas State J. Med. 48:449-453 (July) 1952.
4. McWhirter, R. W.: Value of Simple Mastectomy and Radiotherapy in Treatment of Cancer of Breast, Brit. J. Radiol. 21:599-610 (Dec.) 1948.
5. Saphir, O., and Amromin, G. D.: Obscure Axillary Lymph-Node Metastasis in Carcinoma of Breast, Cancer 1:238-241 (July) 1948.
6. Shimkin, M. B.; Lucia, E. L.; Stone, R. S.; and Bell, H. G.: Cancer of Breast; Analysis of Frequency, Distribution, and Mortality at University of California Hospital, 1918 to 1947, Inclusive, Surg., Gynec. & Obst. 94:645-661 (June) 1952 (fig. 4 and 5, p. 654).
7. Shimkin, M. B.; Lucia, E. L.; Stone, R. S.; and Bell, H. G.: Cancer of Breast; Analysis of Frequency, Distribution, and Mortality at University of California Hospital, 1918 to 1947, Inclusive, Surg., Gynec. & Obst. 94:645-661 (June) 1952 (table 7, p. 653).
8. Stout, A. P.: Lesions of Breast, Postgrad. Med. 5:101-106 (Feb.) 1949.

♦ Dr. Mallams and Dr. Miller, Baylor University Hospital, Dallas.

ABSTRACT OF DISCUSSION

DR. DAVID M. EARL, Houston.—When a cancer of the breast is not associated with gross axillary lymphadenopathy, the chances of subclinical metastasis being present are in the range of 25 per cent or more of the cases. If the axillary nodes are truly negative, the internal mammary nodes may be positive in 10 per cent of the cases.[1] Andreassen, Dahl-Iversen, and Sørensen[2] have demonstrated unsuspected supraclavicular lymph node involvement in 17 per cent of the cases where there was no gross axillary adenopathy. In the presence of gross axillary lymphadenopathy, this figure is 33 per cent and the internal mammary lymph node involvement increases to 48 per cent. In other words, with grossly positive axillary lymphadenopathy, the chances of having positive internal mammary lymph nodes is about 50 per cent. Wangensteen[3] has shown involvement of either the supraclavicular or the internal mammary nodes in 60 per cent of cases where the axillary nodes are involved by metastatic neoplasm from the breast.

Residual breast cancer in the skin flaps is a variable but significant factor.

Anterior chest wall involvement, by extension beneath the primary tumor, must be taken into consideration as a site for residual cancer following even the most expert surgery.

This analysis of regional lymphatic involvement, skin recurrences, and chest wall residuals following so-called localized disease would seem to justify the use of supplementary irradiation therapy since neither microscopic nor macroscopic cancer can be trusted.

DR. J. M. BROWN, Marlin.—The presentation of Drs. Miller and Mallams was excellent and exhibits enthusiasm required in treatment of cancer of the breast; however, review of work in a small series of cases at our clinic revealed excellent results in stage 1 cases no matter what the procedure. It seems that simple mastectomy, simple excision, or simple irradiation treatment would suffice for all stage 1 cases. In all cases above stage 1, results were relatively poor, and review of case histories indicates that a great many of these patients would have done as well if nothing had been done or if simple procedures such as simple mastectomy and palliative therapy had been followed. In this group 3 patients died within a year and a half after incisive biopsies, which suggests that surgical procedures that cut through tumors are indeed dangerous and probably change radically the life history of a tumor. Adopting the criterion of one of the foremost radiotherapists of today that "one cannot treat what he cannot see" might become important. In the stage 1 group, 1 patient lived 23 years following simple mastectomy, and the recurrent tumor became disabling after 22 years. In another, with simple excision, the disease re-

[1] *Handley, R. S., and Thackray, A. C.: Invasion of Internal Mammary Lymph Nodes in Carcinoma of Breast, Brit. M. J. (Jan. 9) 1954, pp. 61-63.*

[2] *Andreassen, M.; Dahl-Iversen, E.; and Sørensen, B.: Glandular Metastases in Carcinoma of Breast; Results of More Radical Operation, Lancet 1:176-178 (Jan. 23) 1954.*

[3] *Wangensteen, O. H.: Super-Radical Operation for Breast Cancer in Patient with Axillary Lymph-Node Involvement, Proc. Second Natl. Cancer Conf., Cincinnati, 1954, pp. 230-242.*

curred at the end of seven years. It was then treated by radical mastectomy and postoperative irradiation, and eight years later the tumor recurred in the axilla and was treated by palliative roentgen therapy. The patient lived six years after this with no evidence of disease.

Hormone therapy and certain radioactive materials have been established as procedures in advanced disease as an adjunct to palliative roentgen therapy, but the procedures of hypophysectomy, thoracic and supraclavicular dissection, adrenalectomy, oophorectomy, and the like have lent only a few weeks of rather miserable life and should be relegated to research.

Suffice it to say that careful, unbiased review of our past cases might lend to more gentle and judicious handling of the female breast with employment of simpler, less disabling procedures without loss and with possible gain in cure rate, longevity, and comfort of the patient.

Carcinoid Tumors Of the Rectum

Clinicopathologic Study Of 14 Cases

W. R. MATHEWS, M. D.

Shreveport, Louisiana

Dr. W. R. Mathews, pathologist at the Confederate Memorial Medical Center, Shreveport, was a special speaker at the 1956 Annual Session of the Texas Medical Association in Galveston and presented this paper for the Section on Clinical Pathology, April 23.

In this study, 14 cases of rectal carcinoids are characterized as to symptoms, site and type of lesion, metastases, treatment, and results. The histology is not unlike that of ordinary appendiceal carcinoids in most instances. An example of carcinoid colliding with rectal carcinoma is recorded. Problems of treatment are discussed.

CARCINOID TUMORS of the rectum have been largely overlooked until recently. During the three decades following the report of the first case in 1912,[15] only 5 additional examples were added.[16] However, the literature of the last 10 years reflects a proportionate interest in carcinoids occurring in locations other than the appendix and small bowel. Well over 100 cases of rectal carcinoids are now on the record.[3, 6, 7, 10, 11, 12, 13, 16] From these studies it has been indicated that certain histologic variations[6, 12, 16] are somewhat peculiar to lesions of this distribution and that the rate of clinical malignancy is low.

All investigators are now in agreement that carcinoid tumors are malignant[1, 12, 14] although characteristically slow in growth and metastasis. Even after the disease has spread to the lymph nodes or other parts, it may produce little or no effect on the patient for periods of months or years.[7, 9, 18] A little more than 10 per cent of rectal carcinoids have developed metastases,[10] a figure which exceeds that for similar growths of the appendix,[12] but is only about one-fourth as great as that for carcinoids elsewhere in the gastrointestinal tract.[14] The favorable position held in this regard by appendiceal and rectal carcinoids appears to rest mainly on circumstances leading to early surgical intervention. In the appendix, owing to its small lumen, such a growth is not long in causing obstructive appendicitis, and routine proctologic examination directs attention to rectal lesions often when they are in a favorable stage.

Although several important studies on carcinoid tumors of the rectum have been contributed, there still exist weak links in the chain of our knowledge of this disease. Despite the pyramiding of case reports within the past decade, it is almost certain that the incidence of the lesion is greater than presently indicated. The practice of local definitive treatment of small, submucosal nodules without biopsy and the occasional erroneous diagnosis of carcinoid as carcinoma have been contributing sources to the low rate of occurrence. Six of the 11 patients reported as having had abdominoperineal resections had had a preoperative diagnosis of carcinoma.[3] Long range follow-up studies on treated cases have been scarce, and as long as this situation prevails, the present program of treatment will remain somewhat in doubt.

There have been 14 cases of rectal carcinoid studied in the laboratory of the Confederate Memorial Hospital since 1946. Six of these (cases 11, 12, 13, 14, 15, and 16) have been summarized in a previous publication.[7] Seven cases were represented by surgical specimens referred from outside sources. No record of the lesion could be found in 9,317 autopsies performed in this hospital during the past 26 years. However, the cursory manner in which the lower rectum was often examined detracts from the value of this observation.

CASE REPORTS

CASE 1.—On January 26, 1946, Mrs. E. A. G., a 35 year old white woman, was found to have an asymptomatic submucosal nodule on the anterior wall of the rectum at a distance of 8 cm. above the anal margin. After biopsy, the

tumor was removed by local excision and was found to show yellow color and to measure .9 cm. in diameter. Microscopically, it showed the structure of the ordinary appendiceal carcinoid and, except for invasion of the mucosa, was confined to the submucous layer. The silver stain was not done. The patient has remained free from recurrence more than 10 years.

CASE 2.—G. C., a Negro woman 75 years of age, entered the hospital on November 13, 1948, with hypertensive heart disease. Routine examination disclosed a sessile nodule, estimated to measure 2 cm. in diameter, at a level 8 cm. above the anal margin. A biopsy revealed the growth to be a carcinoid with no significant departure from the classical structure observed in lesions of appendiceal and ileal distribution. Cords of tumor cells separated the fibers of the muscularis mucosae and ramified in the mucosa. The silver stain was negative. The patient rejected treatment of the rectal lesion and withdrew from the hospital after improvement of the cardiac status. She died of heart disease June 29, 1950, approximately 18 months after biopsy.

CASE 3.—A. R. C., a 47 year old white man, back home from Honduras, consulted a physician because of the recent development of diarrhea. Four months previously he had had bloody diarrhea associated with amebiasis. Examination disclosed a pea sized submucosal nodule on the left side of the rectal wall 10 cm. above the anal margin. A biopsy revealed the lesion to be carcinoid, and it was removed by local excision. The only histologic departure from the ordinary carcinoid was the presence of a few glands in the mucous aspect of the tumor. The silver stain was negative. Except for invasion of the mucosa, the lesion was confined to the submucous zone.

CASE 4.—A fragmented rectal tumor, measuring approximately .8 cm. in diameter, was removed from W. G. A., a white man, aged 37 years, on October 12, 1951. In the course of a routine medical examination, an asymptomatic submucosal nodule was found at a distance of 6 cm. above the anal margin. It was removed by local excision. Microscopically, the pattern of growth was mainly nests and columns of radially arranged columnar cells around small spaces and rarified centers. There was penetration of the muscularis mucosae and invasion of the mucosa. The silver stain was not done. Adequacy of removal of the tumor was indeterminate because of the fragmented state of the specimen. The patient has remained free from disease for approximately four years.

CASE 5.—M. M., a 40 year old white man, sought medical attention on January 7, 1952, because of a nonbloody diarrhea of six weeks' duration. He had been treated for amebic dysentery without relief. Proctologic examination revealed a match-head sized sessile nodule 6 cm. above the anal margin. It was removed by local excision and measured .5 cm. in diameter. Microscopic examination revealed glandlike formations, narrow columns of columnar cells which tended to interconnect, and solid nests of small polygonal cells containing uniform ovoid nuclei with fine chromatin stippling and no mitotic activity. Except for invasion of the mucosa, the process was confined to the submucous layer. There has been no recurrence for a little more than four years.

CASE 6.—J. M., a 50 year old white man, consulted his physician on October 20, 1954, because of diarrhea. Examination disclosed a sessile nodule which measured 1 cm. in diameter on the anterior wall of the rectum 8 cm. above the anal margin. It was removed by local excision. Except for the presence of glandlike formations, the histologic pattern was the classical one (fig. 1); the mucosa was invaded. Adequacy of removal could not be determined because of the fragmented state of the specimen. There was no evidence of disease when the patient was last examined on March 1, 1956.

CASE 7.—M. H., a 76 year old Negro woman, was admitted to the hospital on February 15, 1955, because of weakness and fainting due to hemorrhage from a duodenal ulcer of long standing. Routine proctologic examination revealed a sessile polyp measuring .8 cm. in diameter on the anterior wall, at a distance of 8.5 cm. above the anal margin. This was removed by local excision. The histologic features were, by and large, those observed in ordinary appendiceal carcinoids. Glandlike formations were present in the mucous aspect of the tumor. The silver stain was negative. Except for invasion of the mucosa, the lesion lay in the submucosal zone. There was no evidence of recurrence on March 1, 1956, the date of the last follow-up.

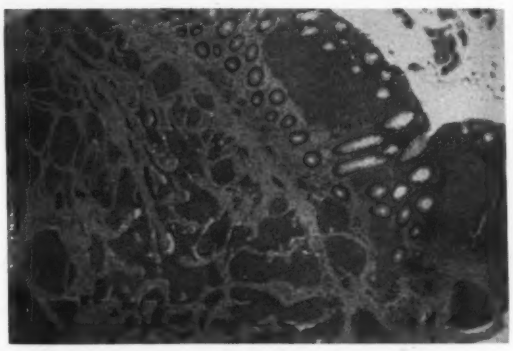


Fig. 1. Case 6. A photomicrograph showing the structure of ordinary carcinoid.

CASE 8.—Mrs. D. W. G., a white woman, 62 years old, developed recurrent episodes of cramping abdominal pain in July, 1955; a few months later she began to pass blood and mucus in the stools. She had had a right radical mastectomy in 1949 for carcinoma and had been treated for basal cell carcinoma of the face in 1953. Proctoscopic examination revealed a large, annular, stenosing, ulcerated lesion of the rectosigmoid. A biopsy from the lower margin of the tumor was diagnosed as carcinoid. An abdominoperineal resection and panhysterosalpingo-oophorectomy were done on January 27, 1956. The bowel segment measured 26 cm. and showed the lower margin of the tumor to lie 12 cm. above the anal margin. The tumor measured 6 cm. in the long axis of the bowel, was ulcerated and moderately stenotic, and was limited by prominent nodular margins (fig. 2 above). A napkin ring type of constriction was observed to encircle about one-half of the circumference of the serosal aspect. Several of the regional lymph nodes were involved by tumor. The corpus and cervix uteri and right adnexa showed nothing pertinent. The left ovary measured 11 cm. in its greatest dimension and was replaced by a fragmented, pinkish yellow tumor which surrounded an irregular, centrally located cavity. Microscopically, the tumor showed a variable structure. In sections from the lower margin, medium sized polygonal cells with indistinct borders grew diffusely or in parallel columns like palisades. The nuclei were variable in size, sometimes vesicular in appearance, and rarely showed mitotic figures. A less conspicuous change was the presence of sharply delineated ovoid nests of round or polygonal cells with small uniform nuclei, showing fine chromatin stippling. Similar areas, occurring in the submucosa and at deeper levels in the wall, occasion-

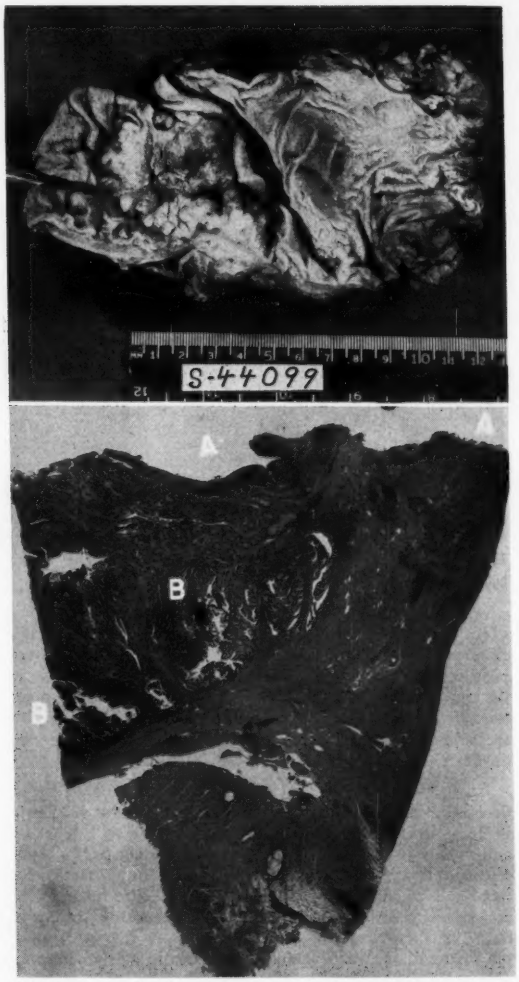


Fig. 2. Case 8. Above. A gross lesion showing carcinoid in the lower margin and adenocarcinoma elsewhere.

Below. Enlarged photomicrograph of a section from the lesion showing collision of carcinoid (A) with carcinoma (B).

ally showed small empty vesicle-like spaces. Individual cells in both structural patterns gave a positive reaction to the mucicarmine stain. And finally, there was much of the tumor, in fact most of it, which showed the structure of the conventional type of adenocarcinoma of the rectum. This was sharply demarcated from, though colliding with, the part showing the carcinoid-like structure (fig. 2 below). All of the regional nodes contained adenocarcinoma; 2 of them showed, in addition, nests and sheets of monotonously uniform small cells which appeared typical of carcinoid. The left ovary was totally occupied by adenocarcinoma.

DISCUSSION

The patients and their symptoms have been tabulated in table 1. The occurrence of the lesion was the same in both sexes. The average age was 52.3 years, with only 2 patients being less than 40 years. Half of the patients had symptoms that were probably or definitely referrable to the rectal disease. Diarrhea

TABLE 1.—*Fourteen Patients and Their Symptoms Indicating Carcinoid Tumors of the Rectum.*

	Patients		Symptoms
	Male	Female	
	Age (yr.)		
White	37	35	Incidental finding 7
	40	55	Diarrhea 3
	47	75	Rectal bleeding 2
	50		Constipation 1
Negro	40	38	Low back pain 1
	49	52	
	65	72	
		78	

was present in 3 patients, rectal bleeding in 2, constipation in 1, and low back pain in 1. Symptoms suggestive of rectal disease were absent in the other 7 patients, their lesions being disclosed through routine rectal examination. Approximately two-thirds of the reported cases have been asymptomatic; when symptoms were present, they were not unlike those commonly observed in association with carcinoma of the rectum.

In table 2, an attempt has been made to indicate the location of the lesion in the rectum, the anatomic types, and the simultaneous occurrence of other pri-

TABLE 2.—*Location of Lesion, Types of Tumors, and Other Primary Neoplasms in 14 Cases of Carcinoid of the Rectum.*

Location in rectum	A8, A8, A8.5, A8.5, A10, L8, L10, P5, P9, R6, R6, R6, R8, R12*
Types of tumors	Submucosal nodules in 8 cases, measuring from .5 to 1 cm.
	Sessile nodule of unknown extent in 1 case, measuring 2 cm.
	Sessile polyps in 2 cases, measuring .8 and 1.5 cm.
	Annular stenosing lesion in 1 case.
	Nodular infiltrating lesions in 2 cases, measuring 2 and 3 cm.
Other primary neoplasms	Carcinoma of rectosigmoid 2
	Adenomatous polyps of rectum 2
	Melanoma of toe 1

*The figures represent centimeters above the anal margin, and the letters indicate the wall of the organ involved (A, anterior; L, left; P, posterior; R, right).

mary neoplasms. Two-thirds of the lesions occurred in the lower half of the rectum; and in those with indication, its occurrence on the anterior wall equaled its distribution in all other locations combined. The

majority of the tumors were freely movable submucosal nodules ranging from .5 to 1 cm. in diameter. In 2 cases, the lesions were larger nodular masses infiltrating the rectal wall. In the remaining patients, sessile polyps occurred in 2, an annular stenosing growth in 1, and a sessile nodule of unknown extent was present in 1 (case 2).

Neoplasms of the rectum, other than carcinoids, were present in 4 cases. Adenomatous polyps were present in 2 patients (cases 15 and 16)[7] and in 1 of these, there was also melanoma of the left great toe. Carcinoids were associated with carcinoma of the rectosigmoid in 2 cases, occurring as an independent lesion in 1 patient (case 13)[7] and apparently as a collision tumor in the other case. The latter lesion showed unique structure. The lower margin in its entire circumference showed histologic characteristics which were more like carcinoid than carcinoma. This merged with the central ulcerated portion which uniformly showed the structure of a deeply invasive adenocarcinoma of the conventional type. The part resembling carcinoid, however, was not altogether uniform in structure. Solid nests of monotonously regular cells with uniform nuclei, as observed in ordinary carcinoid, were intermixed with palisaded columns and diffusely arranged cells which were somewhat variable in size and nuclear characteristics. However, the composite picture was within the range of accepted histologic variation of carcinoid tumors of this distribution, and would probably stimulate no comment except that it formed a part of an ordinary adenocarcinoma. The possibility of independent carcinomas of different histologic types which have collided in the course of their development has been considered. Small cell carcinomas of the rectum have been mistaken structurally for carcinoids.[12, 17]

Malignant tumors of a different histologic type, in association with carcinoids of the gastrointestinal tract, have been recorded by several observers.[12] However, Duke's observation of carcinoids in 3 surgical specimens of the rectum containing carcinoma appears to be the only previous report of coexistent carcinoid and carcinoma of this organ.[4]

In table 3, the treatment, the metastases, and the follow-up studies are tabulated. Eight of the patients had their lesions removed by local excision and have been free from recurrence for periods ranging from 1 to 10 years. One patient (case 15)[7] rejected further treatment when it was discovered that his tumor had been incompletely removed by local excision; there has been no evidence of recurrence in four years. Local excision of the full thickness of the rectal wall was done for a tumor showing invasion of the inner part of the muscle (case 16);[7] the patient has remained free from disease for more than three years. Abdominoperineal resection was done in the case with the annular, stenosing lesion showing carcinoid and carcinoma. There were metastases to the nodes. The last patient, a 38 year old Negro woman with a deeply infiltrating growth (case 14),[7] had a segmental resection with a pull-through procedure. The regional nodes and veins (tumor thrombi)

TABLE 3.—*Summary of Treatment, Metastases, and Follow Up of 14 Cases of Carcinoid Tumors of Rectum.**

Treatment	Metastases	Follow-up
Local excision—8 cases.	None known.	10, 4, 4, 3½, 3, 1½, and 1 yr.
Incomplete local excision—1 case.	None known.	4 yr.
No treatment—1 case.	None known.	Died of heart disease 1½ yr. after biopsy.
Segmental resection with pull-through procedure—1 case.	Reg. nodes, veins, bones (?).	Died 39 months after operation.
Excision full thickness bowel wall—1 case.	None known.	3⅓ yr.
Abdominoperineal resection—1 case.	Reg. nodes.	2½ mo.

*Carcinoid was an incidental finding in a surgical specimen of the rectum containing carcinoma in 1 case.

showed involvement. She remained asymptomatic for approximately 20 months and then developed weakness, loss of weight, and bone pain. Roentgenographic survey of the skeletal system disclosed many small areas of condensation in all of the bones, but especially in the pelvis (fig. 3). We have regarded the

Fig. 3. Case 14. A roentgenogram of the pelvis showing probable metastatic carcinoid.

bone changes as probably due to metastatic carcinoid, but since the patient refused biopsy, histologic proof is lacking. She died 39 months after the operation.

In our experience, the structural characteristics of carcinoids of the rectum, by and large, have been comparable to those of the ordinary carcinoid. Rib-

bon-like festoons of columnar and prismatic cells were approached in only 2 of the cases (fig. 4). Stout found this peculiar pattern of growth in 4 of 6 cases studied.[16] Glands or glandlike formations were observed in about one-third of the cases. The silver stain was carried out in 9 cases with positive results in 3.

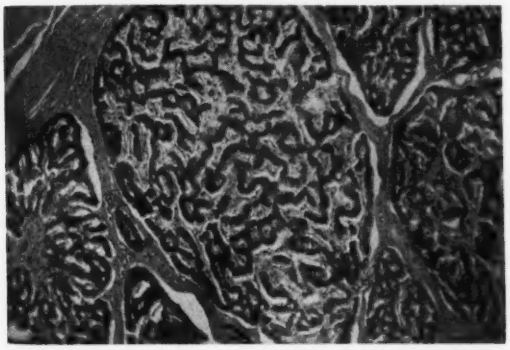


Fig. 4. Case 13. Carcinoid of the rectum showing ribbon-like festoons of cells.

As yet, the accumulated experience in treating carcinoids of the rectum is not enough to bridge all of the uncertainties in this field. On the whole, the indications of treatment are better understood and more sharply drawn in the advanced than in the less advanced stages. In lesions with extensions or metastases that are not resectable, simple excision of the primary growth, with as much of the spread as possible, is recommended. Such a procedure might prove to be of crucial importance in those cases in which the remaining metastatic deposits elected to grow slowly or remain stationary for many years. One of our patients with carcinoid of the small bowel survived 14 years after development of metastasis to the liver (case 12).[7] In lesions with well developed and easily demonstrable infiltration of the rectal wall, the treatment is the same as for carcinoma of this organ. Lesions with lesser degrees of infiltration, involving the inner portion of the musculature only, form a category in which treatment at the present time is empirical. Simple excision of the part of the segment bearing the tumor has been regarded as adequate treatment in such cases. However, recent reports of metastases to lymph nodes and other parts[5, 8, 19] from lesions of this order suggest the need for reexamination of the problems of treatment in tumors of this stage of advancement. Local excision of polypoid or solitary, movable, submucosal nodules is regarded as adequate treatment if the sections reveal the lesion to be limited to the submucosa and to be completely excised. Whether or not the assumption that metastases do not develop from rectal carcinoids confined to the submucosa is correct remains to be seen. Thus far, there have been no reports to the contrary. Obviously, it would be impossible in such cases to exclude metastasis to a deep node which might not become manifest for many years. I have belabored this point somewhat because we have observed metastasis to a lymph node from a gastric carcinoid which was confined to the submucosal layer. Figure 5 illustrates the entire carcinoid from the posterior wall of the stomach of a 16 year old Negro boy who died of a perforated peptic ulcer. Metastasis had developed in a solitary gastric lymph node. How often such an event occurs is altogether problematical. It is likely to be of rare occurrence, and it would be unsound to switch to a more radical form of treatment of this type of lesion on the basis of a single fortuitous observation.

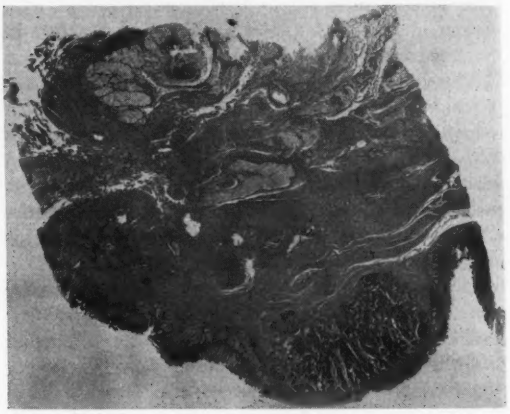


Fig. 5. Carcinoid of the stomach apparently limited to the submucosa, which metastasized to a gastric lymph node.

SUMMARY

More than half of 14 cases of rectal carcinoids studied were small, movable, submucosal nodules which were palpable on digital examination and amenable to local excision. Half of the patients were asymptomatic, and their lesions were disclosed through routine examination. Two patients had metastases, and 1 has died of the disease. An instance of carcinoid colliding with carcinoma of the rectum is recorded. In most instances the histology of the tumors was not unlike that seen in ordinary carcinoid of appendiceal origin. In connection with comments on the problems of treatment, an instance of metastasis from a gastric carcinoid apparently confined to the submucosa has been cited.

REFERENCES

1. Ariel, I. M.: Argentaffin (Carcinoid) Tumors of Small Intestine; Report of 11 Cases and Review of Literature, Arch. Path. 27:25-52 (Jan.) 1939.

2. Ashworth, C. T., and Wallace, S. A.: Unusual Locations of Carcinoid Tumors, Arch. Path. 32:272-276 (Aug.) 1941.

3. Diffenbaugh, W. G.; Lake, T.; and Stanger, J.: Carcinoid Tumor of Rectum, Ann. Surg. 139:379-381 (March) 1954.

4. Dukes, C. E.: Peculiarities in Pathology of Cancer of Ano-Rectal Region, Proc. Roy. Soc. Med. 39:763-765 (Oct.) 1946.

5. Epps, C. H.; White, R. N.; and Hanan, E. B.: Metastasis of Rectal Carcinoid to Broad Ligament, J.A.M.A. 149:1205-1209 (July 26) 1952.

6. Horn, R. C., Jr.: Carcinoid Tumors of Colon and Rectum, Cancer 2:819-837 (Sept.) 1949.

7. Ilgenfritz, H. C., and Mathews, W. R.: Carcinoid Tumors of Gastro-Intestinal Tract, Ann. Surg. 141:807-818 (June) 1955.

8. Kunkel, W. M., Jr.; Waugh, J. M.; and Dockerty, M. B.: Carcinoid of Rectum with Metastasis: Report of Case, Ann. Surg. 139:224-229 (Feb.) 1954.

9. Mallory, T. B., and others: Case Records of Massachusetts General Hospital, Case 26162 (Carcinoids, Multiple, of Ileum with Regional Metastasis), New England J. Med. 222:684-687 (April 18) 1940.

10. Mrazek, R. G., Jr.; Godwin, M. C.; and Mohardt, J.: Carcinoid Tumors: Clinical and Pathological Study of 27 Cases, Surg., Gynec. & Obst. 96:661-673 (June) 1953.

11. Pearson, C., and Fitzgerald, P. J.: Carcinoid Tumors of Rectum; Report of 3 Cases, 2 with Metastases, Ann. Surg. 128:128-143 (July) 1948.

12. Pearson, C. M., and Fitzgerald, P. J.: Carcinoid Tumors—Re-Emphasis of Their Malignant Nature; Review of 140 Cases, Cancer 2:1005-1026 (Nov.) 1949.

13. Rigdon, R. H., and Fletcher, D. E.: Multiple Argentaffin Tumors (Carcinoids) of Rectum, Am. J. Surg. 71:822-824 (June) 1946.

14. Ritchie, G., and Stafford, W. T.: Argentaffin Tumors of Gastrointestinal Tract, Arch. Path. 38:123-127 (Sept.) 1944.

15. Saltykow, S.: Ueber die Genese der "karzinoiden Tumoren" sowie der "Adenomyome" des Darmes, Beitr. z. path. Anat. u. z. allg. Path. 54:559-594 (June) 1912.

16. Stout, A. P.: Carcinoid Tumors of Rectum Derived from Erspamer's Pre-Enterochrome Cells, Am. J. Path. 18:993-1009 (Nov.) 1942.

17. Stout, A. P.: Tumor Seminar (Adenomatous Polyp of Rectum in Child), Texas State J. Med. 41:564-597 (March) 1946.

18. Terplan, K.; Weintraub, D.; and Wolf, N. J.: Stationary Metastasizing Carcinoid of Ileocecal Valve, Arch. Path. 30:1155 (Nov.) 1940.

19. Wilson, H.: Carcinoid of Rectum, Arch. Path. 48:187-189 (Aug.) 1949.

◗ Dr. Mathews, 1541 Kings Highway, Shreveport.

Knowing Occupational Environment Helps

The importance of the physician becoming familiar with the occupational environment of his patients, particularly if his clientele comes largely from industrial workers, is emphasized in a report of the Council on Industrial Health of the American Medical Association printed in the December 8 issue of the *Journal of the American Medical Association* (p. 1387).

The report points out that the physician thus may be able to diagnose and treat disease affecting his patient more adequately, may help better to match the physical abilities of a prospective employee with job requirements, and may be more effective in helping to prevent occupational diseases and accidents. A personal survey of the industrial plants by the physician and an understanding of the commonly observed injurious materials, hazardous conditions, harmful operations, accident hazards, and sanitation pitfalls reviewed in the report will stand the physician in good stead in his practice and in his role as health educator.

A reference list directs the physician to more exhaustive studies and specific recommendations.

Treatment of Malignant Effusions

JAMES A. MARTIN, M. D., and ROBERT B. CONNOR, M. D.

Dallas, Texas

PROBLEMS in the symptomatic and supportive care of the man or woman with far advanced metastatic cancer are numerous and perplexing. Among the most distressing of these has been the debilitating loss of fluids into various body cavities which often attends metastatic deposits on the serous surfaces. The formation of ascites, pleural effusion, or less commonly, pericardial effusion, may occur so massively that embarrassment to adjacent organs multiplies the sufferings of that patient many fold. If

Dr. James A. Martin presented this paper for the Section on Radiology, Texas Medical Association Annual Session in Galveston, April 24, 1956.

Radioactive colloidal gold and chromic phosphate treatment of massive effusions accompanying metastatic neoplasm to serous surfaces increases the patient's comfort and controls the fluid formation to some degree. Case reports illustrate such therapy, which supplements roentgen ray and nitrogen mustard as a helpful modality. Radioactive material also has given encouraging results as postoperative prophylaxis.

the terminal event is not near, the anxiety and distress accompanying the many paracenteses required for the duration of life are in themselves an exhausting experience. For these reasons, there has been considerable enthusiasm in recent years for several methods designed to combat this problem, at least in part.

J. H. Müller of Switzerland[19] is credited with the first clinical application of radioactive colloidal gold given intraperitoneally in the treatment of the effusions of metastatic ovarian carcinoma. The logic of this procedure has been demonstrated in mice by Goldie and Hahn,[11, 12] who were able to inhibit the peritoneal implantation and growth of transplanted tumor cells by intraperitoneal instillation of radio-

active gold. A number of clinical investigators since have reported the clinical use of this material for effusions of various origins, and reports of substantial clinical benefit are presented in ranges up to 50 to 70 per cent.[1, 8, 17, 18, 26] There are also indications that this material may have real value in a prophylactic sense to avoid implantation of tumor cells inadvertently distributed in the peritoneal cavity at the time of surgery.[8, 26] Similar studies with similar clinical results have been conducted using radioactive phosphorus in the form of the colloid, chromic phosphate. This material has several advantages since it is a pure beta emitter with a longer half-life than gold, thus obviating the necessity of protection against a gamma component and allowing storage of the material for greater availability. An entirely different principle is involved in the direct intracavitary injections of rather large doses of nitrogen mustard as employed in other clinics, also with similar degrees of benefit.[4, 27] The obvious advantages of this material would be its low cost, ready availability, and complete avoidance of any radiation hazard (table 1).

TABLE 1.—*Comparison of Treatment Agents.*

Quality	Radioactive Gold	Chromic Phosphate	Nitrogen Mustard
Physiologically	Harmless	Harmless	Cytotoxic
Half-life	2.69 d.	14.3 d.	
Particle size	0.003-0.007μ	0.03-0.05μ	
Beta energy (max.)	0.98 MEV	1.72 MEV	
Beta range (water)	3.8 mm.	8.0 mm.	
Radiation hazard	Moderate	Little	None
Cost	Expensive	Less expensive	Cheap
Procurement	Difficult	May store	Available
Administration	Gamma protection	Beta protection	No protection

The purpose of this study is to present the results obtained in two clinics using radioactive materials prophylactically and for palliative purposes. Fifty-two injections of radioactive colloidal gold were given, 41 for palliative treatment of effusions secondary to metastatic neoplasm and 11 for prophylactic purposes. Sixteen administrations of radioactive phosphorus were given, 13 for the treatment of effusions and 3 for prophylactic purposes. The phosphorus is prepared in colloid form at the J. K. and Susie L. Wadley Research Institute and Blood Bank as has been outlined in a previous publication.[23] Briefly, the material is prepared by ball mill grinding of ignited chromic phosphate at 50 rpm for 72 to 96 hours. Kelcosol solution (0.5 per cent) is added as a surfactant, and the material is suspended in aqueous dextrose solution. The particle size as determined by electron microscopy ranges from 300 to 500 angstroms with occasional particles of 0.2 micron. The material is stable and there has been relatively little tendency for the particles to form large aggregates (fig. 1). The distribution in animals after intrapleural and intraperitoneal injections has been found similar to results in other laboratories employing other chromic phosphate preparations with an insignificant amount appearing in the reticuloendothelial system. This is probably due to the low dialyzable fraction of 1.0 to 1.3 per cent.

ADMINISTRATION AND DOSAGE

There are many methods of administering colloidal radioactive gold preparations of which we have employed two. A simple device suggested by H. B. Elkins[9, 14] employs a properly shielded B. & D. Cornwall syringe and attached valve mechanism allowing the operator simply to pump the material from a shielded reservoir into the patient through a paracentesis needle. Flushing the apparatus is accomplished by the same mechanism. Another method makes use of disposable plastic intravenous tubing and connectors arranged in such a manner that dilution and transfer of the radioactive material from a shielded reservoir is achieved by air pressure from a remotely connected syringe and three-way stopcock. This method contaminates a minimal amount of reusable apparatus and can be set up easily for multiple administrations, requiring only new sterile tubing and paracentesis needle for each succeeding patient. Preceding or immediately following this procedure, it has been found wise to give the patient a barbiturate or chlorpromazine to combat possible radiation nausea. Since radioactive phosphorus has only beta emission, protective requirements are minimal, and the administration of the material is thus much simplified over that of gold. In both instances, it has been our custom to enforce bed rest, at least for the initial few hours after administration, and to turn the patient 90 degrees each 15 minutes for two or three hours. This enhances mixing and dispersion of the injected material and increases the opportunity for it to come in contact with all surfaces. Obviously, it is necessary for each patient to be hospitalized for several days if these procedures are to be carried out properly.

There is no fixed figure which can be established as the proper one for dosage with any of these materials. With gold we have employed a range of dosage in the pleural cavity from 50 to 115 millicuries and in the abdominal cavity from 100 to 157 millicuries without determining where the optimum dosage lies. With chromic phosphate our dosage has ranged from 8 to 10 millicuries in the pleural cavity and 15 to 16 millicuries in the abdomen. In general these ranges parallel those used in other clinics.

Both materials create a small incidence of side effects which are usually minimal in view of what may

be accomplished. Nausea, with or without vomiting, is the most common symptom of gold therapy often related as occurring in 1 out of 2 patients treated. In our series, this occurred most often after the larger intraperitoneal doses, never lasted longer than one or two days, and was usually controlled with relative ease after proper medication. This reaction did not occur following chromic phosphate administration, presumably since whole body gamma radiation was not a factor. With both materials there were occasional episodes of low grade fever occurring for a day or two following administration and then subsiding spontaneously. It was not possible to collect complete data on peripheral blood changes, but several patients exhibited evidence of mild bone marrow depression in the week or two following hospital discharge. No patient exhibited evidence of severe marrow hypoplasia as has been reported elsewhere.[5] Perhaps the most distressing side effect encountered has been apparent local chemical irritation of serous surfaces occurring in a few instances immediately after injection with both substances. Pleuritic or abdominal pain in such cases has been severe enough to require narcotics but fortunately has subsided spontaneously each time with complete recovery in a matter of a day or two. We have not yet arrived at an explanation of this phenomenon and why it should occur in a few persons and not in the majority when the same basic material is employed each time. In 1 patient, severe local abdominal pain at the site of introduction occurred upon the administration of several cubic centimeters of dilute gold preventing completion of the procedure. The following week she was able to tolerate instillation of 150 millicuries in 500 cc. of saline solution without any discomfort whatsoever.

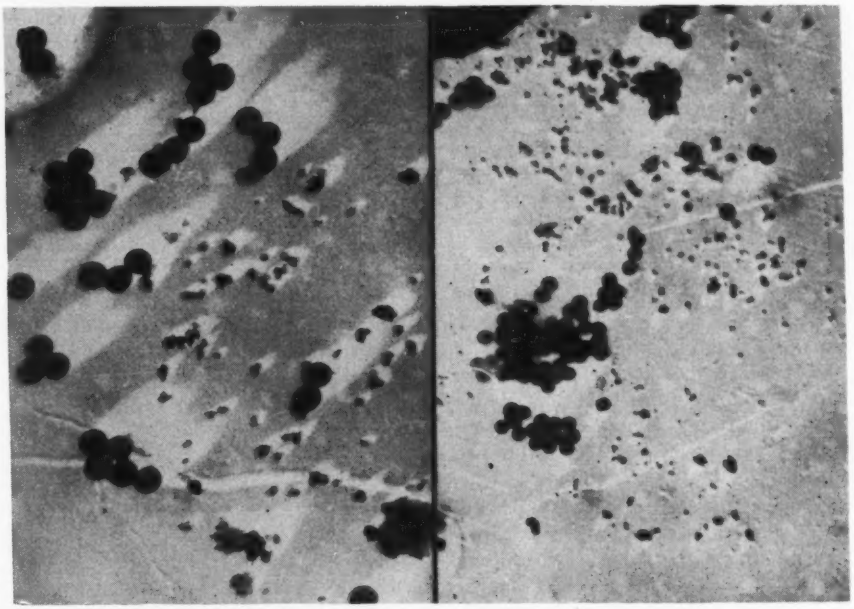


Fig. 1. Electron micrographs of colloidal chromic phosphate (P^{32}). Larger spherical particles are reference latex emulsion, each 0.26 micron in diameter. (From the J. K. and Susie L. Wadley Research Institute and Blood Bank, Dallas.)

RESULTS AND ANALYSIS

It has been difficult to classify and analyze the results of treatment in any logical pattern. In the final analysis our design has been simply to determine whether these patients have been helped or not, and the simplest approach has been to class as "satisfactory" those patients in whom fluid has been retarded or stopped. The term "unsatisfactory" has been applied to those who exhibited no obvious benefit. "Indeterminate" results indicate the patients who survived one month or less allowing insufficient time for adequate evaluation of the radiation response.

A satisfactory result was achieved in 29 instances out of 54 administrations of radioactive material given to 48 patients. An unsatisfactory response was seen in 15 administrations, and results were indeterminate in 10. Moderate side reactions including low grade fever and varying degrees of nausea occasionally accompanied by vomiting occurred in 12 instances. There was no apparent difference in the effectiveness of the two agents used, and there was no significant

variation in response relating to the type of tumor. In this small series, the poorest results generally were obtained in the metastatic breast lesions and in the group in which primary site and type of tumor were unknown. An explanation of the apparent poor response in these two groups may have been related to the advanced stage of the disease at the time the treatment was given.

It is interesting to note from further consideration (table 2) that generally the best results were obtained in cases of serous effusions, and most of the failures were in patients with sanguinous effusions. This observation is consistent with the findings of others.[6] Again, this is probably a reflection of the extensiveness of the disease rather than any relation to the character of the fluid. The site of administration, whether it be pleural, abdominal, or pericardial, seems to have little relation to determining outcome.

TABLE 2.—*Results of Palliative Use of Radioactive Materials for Malignant Effusions.*

Result	Treatments	Type Effusion		Location			Primary Lesion				
		Serous	Bloody	Pleur.	Abd.	Pericard.	Ov.	Breast	Lung	GI	Unknown
Satisfactory	29	19	10	16	13	0	14	4	6	3	2
Unsatisfactory	15	3	12	10	5	0	4	4	2	1	4
Indeterminate	10	6	4	6	3	1	2	4	2	1	1

A smaller number of patients has been treated prophylactically following surgical removal of the primary tumor, usually ovarian carcinoma. The majority of these cases were ones in which there was thought to be complete surgical extirpation, but contamination of the operative area with viable tumor cells remained a possibility. Eleven of these were cases of ovarian adenocarcinoma of whom 9 patients are alive at this time without evidence of recurrent carcinoma. Seven of these 9 have remained clinically well for periods ranging from two to three years; the other 2 for from four months to a year. Two definite failures in the group have developed recurrences in 6 months and 21 months after intraperitoneal therapy. Other lesions treated postoperatively were generally unfavorable ones, and all of these 3 patients have succumbed to their diseases within six months of treatment. These include abdominal tumors from an advanced carcinoma of the cervix, sarcoma in the small bowel mesentery, and an advanced endometrial carcinoma. In the latter patient, it is interesting to note that abdominal recurrence with ascites did not manifest itself until 22 months after treatment with radioactive gold.

CASE REPORTS

CASE 1.—S. G. S., a male dental technician, was first seen at the age of 57 years on February 2, 1952, complaining of dyspnea, nonproductive cough, weakness, and considerable fatigue. Examination revealed partial collapse of the right lung and right bloody pleural effusion which was found to contain malignant cells (fig. 2). A clinical diagnosis of bronchogenic carcinoma with pleural metastases was made. During a three week course of roentgen therapy followed by oral triethylenemelamine, two thoracenteses were required for the relief of respiratory distress. No further chest taps

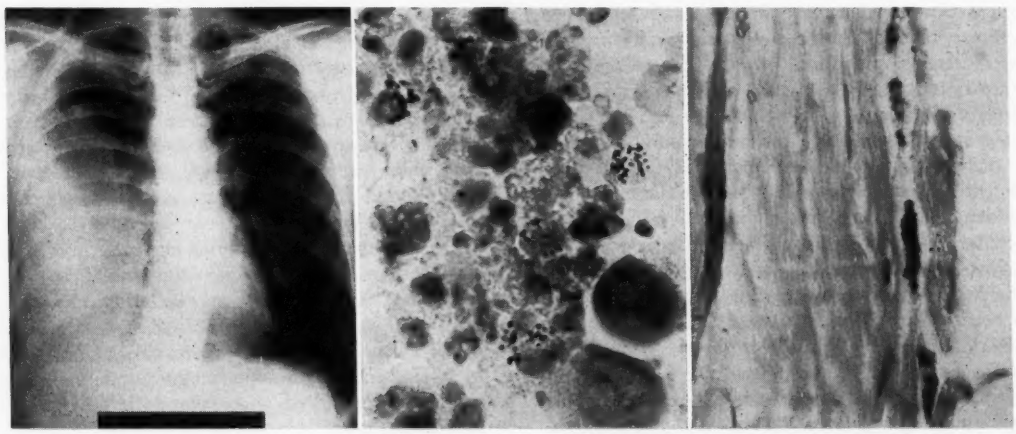


Fig. 2. Case 1. At left is shown a radiograph of the chest outlining a massive pleural effusion compressing the lower lobe of the right lung. A photomicrograph in the center reveals particles of colloid within the cytoplasm of macrophages in the fluid sediment following intrapleural gold therapy. A microscopic section through the pleura shown on the right was taken at autopsy and also discloses similar particles within macrophages on the pleural surface.

were required, and the patient improved generally over the next few months, returning to work. This improvement lasted about eight months after which he again began to suffer symptoms of reformation of right pleural effusion, again with bloody fluid containing malignant cells on microscopic examination. On May 26, 1953, 50 millicuries of radioactive gold was instilled into the right side of the chest. Because he continued to form fluid, a second instillation of 77 millicuries was given September 6. The following month nitrogen mustard was given intravenously (17.1 mg. in four days). No further thoracenteses were required although the patient generally deteriorated during this period and died rather abruptly November 22 in acute respiratory distress.

The outstanding findings at autopsy were total collapse of the right lung with pulmonary edema on the left. Approximately 1,500 cc. of brown colored turbid fluid was found loculated in the right lower pleural space. The pleura was thickened and smooth but without gross or microscopic evidence of metastases. The right lung itself contained no obvious tumor, but squamous cell carcinoma was found in mediastinal and retroperitoneal lymph nodes as well as in the left adrenal gland.

at autopsy no gross or microscopic tumor was found, and in its place was thickened and fibrotic pleura, presumably the result of beta radiation from the radioactive material. Thus fibrosis with disappearance or submerging of tumor implants is a change which may accompany reduction in fluid formation.

CASE 2.—J. V. L., a 48 year old day laborer, was first seen in the emergency operating room September 9, 1953, following an injury to the chest. Routine roentgenograms made at the time demonstrated an infiltrative process in the right midlung field. Physical examination revealed right supraclavicular and cervical adenopathy which by history had been present approximately eight to nine weeks. The patient was asymptomatic except for a slight nonproductive "cigarette" cough present for a year or more. Following his admission, the clinical impression of bronchogenic carcinoma was substantiated by biopsy of the cervical scalene nodes. Deep roentgen therapy was administered to the chest, and the patient did well for several weeks. However, he was readmitted in November with complaints of severe dyspnea and hemoptysis. Fluoroscopic and radiographic examination established the presence of pericardial effusion

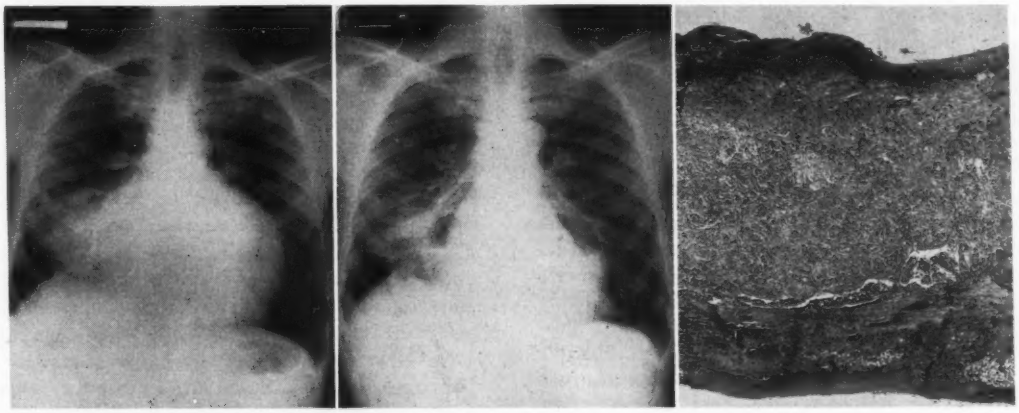


Fig. 3. Case 2. Marked enlargement of the cardiac shadow secondary to massive pericardial effusion is shown in the radiograph at the left. The relatively small cardiac size is shown in the center film following pericardial tap and air instillation. A photomicrograph on the right shows a section through the greatly thickened pericardium obtained at autopsy. The central zone is a dense layer of infiltrating tumor. At the upper margin on the internal surface is a narrow zone of fibrin deposit and necrotic debris apparently the result of surface radiation from the radioactive gold given 16 days previously.

One may appreciate that this man's greatest palliation came from the initial roentgen therapy and triethylenemelamine. It was possible later to control the recurrence of the effusion, but it then required more than one administration of gold. Possibly, gold used initially would have achieved palliation also. It is clear then that older standard methods of treatment are not depreciated by the appearance of these newer methods, and their proper place in the tumor clinic armamentarium must not be neglected.

In this case, it seems reasonable to assume from the many free tumor cells in the fluid that gross tumor nodules must have been present on the pleura at the outset of the recurrent fluid formation. Yet, with tamponade, and fluid obtained upon aspiration of the pericardial sac contained microscopic tumor cells (fig. 3). On December 1, 50 millicuries of radioactive colloidal gold was placed within the pericardium, and the patient had no further accumulation of fluid. Sixteen days later he developed signs of constrictive pericarditis, which became rapidly worse, and he died December 17. Postmortem examination revealed adenocarcinoma of the right upper lobe bronchus with regional lymphatic extension and marked invasion of the pericardium. The cause of death was thought to be constrictive pericarditis resulting in right heart failure. This appeared to be the result of combined pericardial invasion by tumor and radiation effect presumably secondary to the radioactive gold.

It is interesting that a localized radiation effect on the pericardium was sufficient to prevent the effusion and avoid tamponade. However, the same reaction

apparently further reduced pliability of the diseased pericardium, thus aggravating the constrictive process which caused death. Whether a smaller dose of radioactive material in the range of 10 to 15 millicuries might have controlled the fluid formation and allowed this patient a somewhat longer survival is purely speculative.

DISCUSSION

It is evident that there is at present no one best way to combat all malignant effusions. Each of several methods has its advantages and its drawbacks. Roentgen therapy has as its major disadvantage the fact that large volumes of tissues must be treated in order to cover an entire serous surface, and when lung tissue is included in that volume, the result can be an unpleasant pneumonitis followed by fibrosis. On the other hand, if there should be tumors of any size within these cavities, roentgen therapy is the most rational way to approach them. The radioactive colloidal materials have established themselves as useful tools provided they are used in the proper manner, a fact applying to all useful tools. Their shortcomings are relative inaccessibility, moderate radiation hazard, and expense. It should be remembered that patients suffering from malignant effusions are usually near the end of a long expensive illness and further economic burden to them is often a severe hardship. Some of these difficulties are apparently answered by the use of intracavitary nitrogen mustard, according to the experience of others, but this material cannot provide all the needed answers. It is likely that the proper care of these patients might well require access to several of these modalities thus allowing proper application in the proper place.

It will be necessary to define the indications for radioactive colloidal materials carefully and adhere to them if one is to avoid misinterpretation of their value. Although the exact mechanism of fluid formation in malignant disease remains unknown, it is obvious that none of these modalities will be of any value in combating the effusion of portal obstruction, hypoproteinemia, or the chylous effusions secondary to obstruction or trauma of the thoracic duct. With the limited range of beta particles in tissue, it should be equally evident that large tumors cannot be controlled by such surface radiation. A patient with osseous metastases and bone marrow embarrassment stands a chance of further embarrassment after use of radioactive materials, and such a hazard may not be a justified risk. It follows then that rather careful physical examination with laboratory confirmation of neoplastic etiology must precede treatment in all cases. It matters little what machine or device is employed for administration as long as reasonable protection requirements are observed. Of greater importance is care in the site of instillation. Interstitial injection of radioactive materials invites slough and consequent suffering without helping the patient in his original complaint. If fluid is present in multiple loculations without intercommunication, inadvertent instillation of a large dose into a small compartment is likely, with the result that local damage may ensue and other loculations remain untreated. Injection through or into an area of infection invites serious complications and should be carefully avoided.[20] Finally, there is little to be gained by employing such elaborate methods in the severely debilitated patient whose terminal episode is near and where paracentesis alone is sufficient to provide comfort.

It appears that the brightest future for radioactive colloidal materials may be in the prophylactic sense rather than the palliative one. Elkins[10,14] has pointed out that even in cases in which there was thought to be total removal of the tumor without contamination of the operative area, sterile washings have contained viable tumor cells. This observation combined with the work of Goldie and Hahn[11, 12] in animals lends support to the thesis that prophylactic intra-abdominal gold or chromic phosphate therapy is a rational procedure. Even in the small group of ovarian carcinomas treated postoperatively in this series one seems justified in saying that there has been evidence of some benefit. The early recurrence rate in this group is low, and 1 of those patients who developed recurrences did so after an extended period of asymptomatic comfort. Further observation will determine how many of the others may yet develop recurrences and whether the actual cure rate can be improved. At the moment, it is sufficient to say that the method shows promise and is well worth studying further.

SUMMARY

Massive effusions accompanying metastatic neoplasm to serous surfaces is a debilitating problem further complicating a hopeless disease. A measure of increased comfort and control of fluid formation can be obtained by proper selection and use of several modalities. Results of treatment in our clinics with radioactive colloidal gold and chromic phosphate are presented and analyzed. Case reports illustrate some of the interesting observations of the study. Experience obtained from use of these materials prophylactically in a small group of postoperative patients is encouraging.

We are indebted to Dr. Ralph S. Clayton, who directed the treatment of some of the patients included in this study and helped develop some of the techniques of administration and control.

REFERENCES

1. Andrews, G. A.; Root, S. W.; Kerman, H. D.; and Bigelow, R. R.: Intracavitary Colloidal Radiogold in Treatment of Effusions Caused by Malignant Neoplasms, Ann. Surg. 137:375-381 (March) 1953.
2. Andrews, G. A., and others: Metabolism and Distribution of Colloidal Au^{198} Injected into Serous Cavities for Treatment of Effusions Associated with Malignant Neoplasms, Cancer 6:294-302 (March) 1953.
3. Bauer, R. E.; Moss, I. H.; and Richardson, A. D.: Study of Radioactive Phosphorus Activities in Pleural Effusions, Cancer 7:852-855 (Sept.) 1954.
4. Bonte, F. J.; Storaasli, J. P.; and Weisberger, A. S.: Comparative Evaluation of Radioactive Colloidal Gold and Nitrogen Mustard in Treatment of Serous Effusions of Neoplastic Origin, Radiology 67: 63-66 (July) 1956.
5. Botsford, T. W.; Wheeler, H. B.; Newton, R. A.; and Jaques, W. E.: Hypoplasia of Bone Marrow Associated with Radioactive Colloidal Gold Therapy, J.A.M.A. 151:788-791 (March 7) 1953.
6. Cantril, S. T.: Care of Patient with Advanced Cancer of Breast, Radiology 66:46-54 (Jan.) 1956.
7. Clarke, T. H.: Radioactive Colloidal Gold Au^{198} in Treatment of Neoplastic Effusions, Quart. Bull. Northwestern Med. Sch. 26:98-104 (Summer) 1952.
8. Cowan, I. I., and Karioris, F. G.: Prophylaxis and Palliation of Malignant Effusions with Radioactive Colloidal Gold, Am. J. Obst. & Gynec. 69:312-319 (Feb.) 1955.
9. Elkins, H. B.: Personal Communication.
10. Elkins, H. B.: Personal Communication.
11. Goldie, H., and Hahn, P. F.: Distribution and Effect of Colloidal Radioactive Gold in Peritoneal Fluid Containing Free Sarcoma 37 Cells, Proc. Soc. Exper. Biol. & Med. 74:638-642 (July) 1950.
12. Goldie, H.; West, H. D.; Jeffries, B. R.; and Butler, C. H.: Intrapleurally Injected Colloidal Au^{198} and Growth and Implantation of Free Tumor Cells in Pleural Exudate, Proc. Soc. Exper. Biol. & Med. 80:327-331 (June) 1952.
13. Jaffe, H. L.: Treatment of Malignant Serous Effusions with Radioactive Colloidal Chromic Phosphate, Am. J. Roentgenol. 74:657-666 (Oct.) 1955.
14. Keettel, W. C., and Elkins, H. B.: Experience with Radioactive Colloidal Gold in Treatment of Ovarian Carcinoma, Am. J. Obst. & Gynec. 71:553-568 (March) 1956.
15. Kent, E. M.; Moses, C.; Ford, W. B.; Kutz, E. R.; and George, R. S.: Radioactive Isotopes in Management of Carcinomatosis of Serous Body Cavities, A.M.A. Arch. Int. Med. 94:334-340 (Sept.) 1954.
16. King, E. R.; Spicer, D. W.; Dowda, F. W.; Bender, M. A.; and Noel, W. E.: Use of Radioactive Colloidal Gold (Au^{198}) in Pleural Effusions and Ascites Associated with Malignancy, Am. J. Roentgenol. 68:413-420 (Sept.) 1952.
17. Kligerman, M. M., and Habif, D. V.: Use of Radioactive Gold in Treatment of Effusion Due to Carcinomatosis of Pleura and Peritoneum, Am. J. Roentgenol. 74:651-656 (Oct.) 1955.
18. Lahr, T. N.; Olsen, R.; Gleason, G. I.; and Tabern, D. L.: Animal Distribution of Colloids of Au^{198}, P^{32}, and Y^{90}: Improved Method of Tissue Assay for Radioactivity, J. Lab. & Clin. Med. 45: 66-80 (Jan.) 1955.
19. Müller, J. H.: Premiers Résultats Thérapeutiques, Obtenus à L'Aide de la Radioactivité Artificielle; Démonstration, Schweiz. med. Wchnschr. 80:437-438 (April 29) 1950.
20. Rominger, C. J.: Surgical Complications Associaterd with Intraperitoneal Colloidal Radiogold, Am. J. Surg. 88:574-579 (Oct.) 1954.
21. Root, S. W.; Tyor, M. P.; Andrews, G. A.; and Kniseley, R. M.: Distribution of Colloidal Radioactive Chromic Phosphate after Intracavitary Administration, Radiology 63:251-259 (Aug.) 1954.
22. Rose, R. G.; Osborne, M. D.; and Stevens, W. B.: Intracavitary Administration of Radioactive Colloidal Gold. New England J. Med. 247:663-667 (Oct.) 1952.
23. Speer, R. J.; Maloney, M.; Roberts, A.; and Hill, J. M.: Preparation of Colloidal Chromic Phosphate (P^{32}) for Clinical Investigation, Extrait du Sang 26:853-861, 1955.
24. Speer, R. J.: Personal Communication.
25. Taylor, H. C., and Greeley, A. V.: Factors Influencing End-Results in Carcinoma of Ovary, Surg., Gynec. & Obst. 74:928-934 (May) 1942.
26. Walton, R. J., and Sinclair, W. K.: Intracavitary Irradiation with Radioactive Colloidal Gold in Palliative Treatment of Malignant Pleural and Peritoneal Effusions, Brit. M. Bull. 8:165-171, 1952.
27. Weisberger, A. S.; Levine, B.; and Storaasli, J. P.: Use of Nitrogen Mustard in Treatment of Serous Effusions of Neoplastic Origin, J.A.M.A. 159:1704-1707 (Dec. 31) 1955.

♦ Dr. Martin, 3501 Gaston Avenue, Dallas.
Dr. Connor, 8215 Westchester, Dallas 25.

ABSTRACT OF DISCUSSION

DR. CLAUDE WILLIAMS, Fort Worth: The results my colleagues and I obtain in the use of radioactive gold (Au^{198}) for malignant serous effusions have been essentially, but not quite, equal to those quoted by Drs. Martin and Connor. We have had no experience in the use of colloidal solutions of radioactive phosphorus (P^{32}). We have used Au^{198} prophylactically on two occasions only. One of these patients is alive and well after 18 months and the other after 4 months. Both were cases of ovarian carcinoma.

Before instilling the Au^{198} we try to drain the particular cavity as dry as possible and use around 400 cc. of saline solution to dilute the gold. Rarely can the fluid be completely evacuated and generally there must be 500 cc. or more residual. We believe, as of course does everyone else, that one should make reasonably certain that the fluid is not loculated to the extent that contact of the major portion of the serous surface is precluded. Where the abdomen is concerned, this is difficult short of a pneumoperitoneum; however, the quantity of fluid removed as compared to the estimated quantity within the abdomen and palpation for residual loculations is a fairly good index and certainly of aid. In the chest we find that films taken before and after previous aspirations usually will determine if significant loculation is present. As a rule some air has been introduced and this is also of help. Small loculations are disregarded provided the gold injection is in the major cavity. Establishing that the lung is probably capable of reexpansion is important. In one of our patients following gold therapy fluid rapidly recurred. This was considered to represent a failure and may well have been. A few weeks later, however, the chest was aspirated and the fluid replaced by an equal quantity of air. A film then revealed the lung to be about the size of a normal kidney and to be coated by approximately ½ inch of thickened pleura. Obviously the fluid would recur regardless of any effect by the gold.

Our dosage is also arbitrary and essentially the same as that of the essayists. In general it is 150 millicuries to the abdomen and 90 millicuries to the chest.

We routinely start the patient on Thorazine prior to or at the time of administering the gold. With this routine practically all the patients in whom nausea and vomiting has been a problem have had this difficulty prior to the Au^{198} therapy. Pain of consequence at the time of instillation of the gold has occurred in only 1 patient. She was one of the 2 treated prophylactically and naturally had a dry abdomen. The pain occurred in the region of the right hemidiaphragm, radiating into the shoulder, and was rather severe. It was readily controlled by Demerol and did not recur.

Our patients are asked to change position every 30 minutes until bedtime and are instructed to assume positions that will tend to cause the fluid to gravitate toward the diaphragm or apex of the lung. Also some air is introduced because we think it allows for better mixing.

To our knowledge we have not had a case of serious bone marrow depression out of 64 instillations in 51 patients, and 1 patient received 5 instillations amounting to a total of 510 millicuries over a 12 months period. A complete blood count prior to the last treatment was within normal limits although on the low side.

The administration of Au^{198} in the abdomen or chest without unnecessary exposure, spills, and undue apprehension that it is being injected into soft tissue proved to be more difficult than we anticipated. After trying several methods we settled on one that is not original but more a combination of several others. Since it requires no special equipment, the equipment is not bulky or heavy, and the

method has given consistently satisfactory results, I would like to describe it in conclusion.

A 4 foot piece of polyethylene tubing is obtained. If the chest is to be tapped, a 13 gauge needle is used as the tubing can readily be inserted through this size needle. A small paracentesis trocar is used for the abdomen. After the fluid has been aspirated, one end of the tubing is inserted through the particular paracentesis instrument and the instrument is then withdrawn about the tubing. If the abdomen is being treated, a purse string suture is taken about the wound and immediately tied. Suturing is not necessary for the chest. Into the other end of the tubing an 18 gauge needle is inserted. This needle is sharpened at both ends, and the opposite end is grasped by a forceps to avoid exposure and forced through the rubber cap of the Au^{198} container. The container of gold is at no time removed from the lead protector. A closed 500 cc. intravenous set-up of normal saline solution is assembled, and the needle from this is also inserted into the rubber cap of the Au^{198}. With a 50 cc. syringe having an attached three-way stopcock and needle—the needle being forced through the rubber cap of the saline bottle—air is forced into the saline bottle and a pressure system established. By this method the gold and about 400 cc. of saline solution can be forced through the polyethylene tubing in a relatively short time. The only piece of contaminated equipment necessary to reuse is the 18 gauge needle sharpened at both ends.

Lymphosarcoma

A Study of Five Year Survivals With X-Ray Therapy

DEAN NICHOLS, M. D.;
CHARLES PHILLIPS, M. D.; and
ARNO W. SOMMER, M. D.

Temple, Texas

THIS INVESTIGATION was undertaken to determine the five year plus survival rates of the various categories of lymphosarcoma, using only roentgen-ray therapy as the definitive treatment along with whatever supportive measures were indicated. A comparison between pathologic grading and approximate clinical staging is attempted for the purpose of prognostication.

Only those patients who received all of their roentgen therapy at the Scott and White Clinic were studied so that consistency of treatment would be maintained. Each case was pathologically proven and restudied and classified by the pathologist (C. P.). Only those cases with adequate follow-up were used, and the cause of death in most instances was taken from death certificates; autopsy reports when available were used. The material covered the cases diagnosed from 1936 through 1947.

For the sake of simplicity these lymphoid neoplasms have been put in a single group, using the term lymphosarcoma to include them all. Simple terms such as lymphocytic, lymphoblastic, and reticulum cell are added as adjectives to define the predominant cell types in any given lesion. The neoplasms are graded by the Broder's I to IV method. In general the follicular form of the so-called Brill-Symmers type constitutes most of our grade I tumors. Most of the lymphocytic type comes within the scope of grade II tumors; grades III and IV are lymphoblastic, reticulum, or stem cell forms and are less common in occurrence. Each node is graded on its own appearance, according to the predominant cell type. Serial biopsy studies were not feasible. Mycosis fungoides was not included in this review. Follow-up data have been compiled by standard procedures in accredited tumor clinic methods.

Dr. Dean Nichols formerly was associated with his co-authors at Scott and White Clinic, where he was a resident in radiology, Dr. Phillips was a pathologist, and Dr. Sommer was a radiologist. This paper was presented for the Section on Radiology at the 1956 Annual Session of the Texas Medical Association in Galveston, April 24.

The importance of grading cases of lymphosarcoma is evident in the fact that definite trends may be noted by comparing the various types of lymphoblastoma, namely, the lower the grade, the higher the survival rate, and the more the mixture of types in any one case, the lower the survival rate. Hodgkin's disease gives a reverse trend, with the higher survival rate in the higher grade. Normal life expectancy and that of patients with lymphoblastoma become the same at six years' survival.

General Electric 200 kilovolt Maximar machines were used for the roentgen-ray therapy with the following factors: kilovoltage peak 200; milliampere 18; focal skin distance of 50 cm.; added filtration 1 mm. of copper plus 1 mm. of aluminum (half value layer of 1.68 mm. of copper). The field site and size varied according to the clinical indication. In general a course of approximately 600 r (in air) was given to the superficial nodal areas and approximately 1,140 r (in air) to deeply lying nodal areas—thus tending to equalize the tumor dose. The tumor dose was not calculated as it was found to be too variable. The superficial nodal areas were treated in two successive days and the deeper at a rate of approximately 240 r (in air) per day and according to patient tolerance.

Patients were rechecked at three month intervals, and further roentgen therapy was given as indicated.

The types of lymphosarcoma discussed are lymphocytic, 31 cases; lymphoblastic, 16 cases; lymphoblastic plus lymphocytic, 12 cases; lymphoblastic plus lymphocytic plus follicular, 1 case; reticulum or stem cell, 4 cases; and follicular, 7 cases. These six types are grouped under the heading of lymphoblastoma for the convenience of discussion in this paper and constitute 71 cases. The other two types are Hodgkin's disease, 17 cases, and chronic lymphatic leukemia, 13 cases, making a total of 101 cases reported. For the sake of brevity, basic data and charts will be omitted from this paper.

GRADING

For the convenience of this discussion and for comparative purposes, sites of involvement on admission (as determined by the number of roentgen-ray fields used in the first treatment series) will be considered to correspond roughly to stagings; hence, 1 site on admission is equivalent to stage 1; 2 sites are equivalent to stage 2, and 3 or more sites are equivalent to stage 3.

Lymphocytic Type (31 Cases).—Grade I (9.7 per cent of the type) had 3 cases: 1 woman, age 20 years, died of Hodgkin's disease (proved by autopsy) within the first year of diagnosis; and 2 men, ages 32 and 20 years, were alive at 13 and 8 years after treatment, respectively. All 3 cases were stage 3 on admission of the patient. Grade II (87 per cent of the type) had 8 out of 27 patients surviving five or more years. Of these, 1 man was still alive at 15 years and 2 women at 11 years. The 15 year case was stage 2 at diagnosis, and the 11 year cases were stage 3. Grade III (3.2 per cent of the type) had 1 patient, stage 1, who died in the second year after diagnosis. Grade IV had no cases.

TABLE 1.—*Lymphocytic Type: Summary of Survivals According to Grade.*

Grade	Survived 5 Yr. (%)	Survived 10 Yr. (%)	Alive at Yr.
I	67	33	8, 13
II	29.6	14.8	11, 11, 15
III	0	0	
IV	—	—	

Lymphoblastic Type (16 Cases).—Grade I had no cases. Grade II (6.3 per cent of the type) had 1 case, a woman, age 50 years, who was alive at seven years and was a stage 3. Grade III (62.5 per cent of the type) had 1 case, a man, age 75 years, stage 3, who was alive at 10 years; and 1 case, a man, age 40 years, also stage 3, who was alive at eight years. Grade IV (31.2 per cent of the type) had 1 case, a man, age 67 years, stage 1, who was alive at six years. This patient had his disease about three days before diagnosis and received one series of roentgen therapy of 2,770 r (in air) to the left cervical area.

TABLE 2.—*Lymphoblastic Type: Summary of Survivals According to Grade.*

Grade	Survived 5 Yr. (%)	Survived 10 Yr. (%)	Alive at Yr.
I	—	—	
II	100	0	7
III	20	10	8, 10
IV	20	0	6

Lymphoblastic Plus Lymphocytic Type (12 Cases).—Grade I had no cases. Grade II (58.4 per cent of the type) had 2 cases, both women, with ages 48 and 64 years, who were alive at seven and nine years respectively and were both stage 3. Grade III (41.6 per cent of the type) had no five year survivals. Grade IV had no cases.

TABLE 3.—*Lymphoblastic Plus Lymphocytic Type: Summary of Survivals According to Grade.*

Grade	Survived 5 Yr. (%)	Survived 10 Yr. (%)	Alive at Yr.
I	—	—	
II	28.8	0	7, 9
III	0	0	
IV	—	—	

Lymphoblastic Plus Lymphocytic Plus Follicular Type (1 Case).—Grades I, III, and IV had no cases. Grade II (100 per cent of type) had 1 patient who died in six months.

Reticulum or Stem Cell Type (4 Cases).—Grade I had no cases. Grade II (25 per cent of the type) had 1 patient who died in three months. Grade III (75 per cent of the type) had 2 patients who died in three months and 1 who was killed in one year (car wreck). Grade IV had no cases.

Follicular Type (7 Cases).—Grade I (86 per cent of type) had 2 cases, both women, ages 60 and 41 years, still alive at eight and seven years respectively. The 60 year old, a stage 1, had her disease about 10 days before diagnosis and received only one course of roentgen therapy of 576 r (in air) to the left cervical

TABLE 4.—*Follicular Type: Summary of Survivals According to Grade.*

Grade	Survived 5 Yr. (%)	Survived 10 Yr. (%)	Alive at Yr.
I	33	0	7, 8
II	0	0	
III	—	—	
IV	—	—	

area. The other case was a stage 3. Grade II (14 per cent of type) had 1 patient who died in three months. Grades III and IV had no cases.

By comparing the various types of lymphoblastoma, it is seen that two definite trends stand out, namely, the lower the grade, the higher the survival rate, and the more the mixture of types in any one case, the lower the survival rate.

TABLE 5.—*Lymphoblastoma: Summation of Survivals According to Grade.*

Grade	Cases	Survived 5 Yr. (%)	Cases	Survived 10 Yr. (%)
I	10	50	4	25
II	37	29.8	27	14.8
III	16	12.5	9	11.1
IV	8	12.5	3	0
Totals	71	26.8	43	14

Hodgkin's Disease (17 Cases).—Grade I (5.9 per cent of type) had 1 patient who died in two years. Grade II (65 per cent of type) had 1 patient, a man, age 22 years, with stage 1, but who received additional fields in six months and was alive at 11 years. One patient, an 18 year old girl, with stage 3, was alive at seven years. One patient, a man, age 55 years, with stage 2, died of a coronary occlusion at seven years without evidence of Hodgkin's disease (autopsy report). Another, a woman, age 33 years, with stage 3, died in seven years. And still another, a 23 year old woman, with stage 2, died in five years. Grade III (29 per cent of type) had 1 case, a man, age 21 years, with stage 3, who lived 15 years and died of malignant hypertension with his Hodgkin's disease under control. One case, a woman, age 47 years, with stage 3, lived six years. One case, a man, age 35 years, with stage 1, who had new fields added in six months, was alive at seven years. Grade IV had no cases.

TABLE 6.—*Hodgkin's Disease: Summary of Survivals According to Grade.*

Grade	Survived 5 Yr. (%)	Survived 10 Yr. (%)	Alive at Yr.
I	0	0	
II	45.5	12.5	7, 11
III	60.0	33.3	7
IV	—	—	

Hodgkin's disease behaves differently from lymphoblastoma in that the trend shown by grading is the reverse, that is, the higher the grade, the higher the survival rate.

Chronic Lymphatic Leukemia (13 Cases).—This type was not graded.

Typing is important as there is variation between the types in regard to survival. Figure 1 demonstrates this. It shows also that the lymphocytic type has the best prognosis and that the more the combination of types in a case, the poorer the prognosis. This figure shows that the five year survivals in percentages for

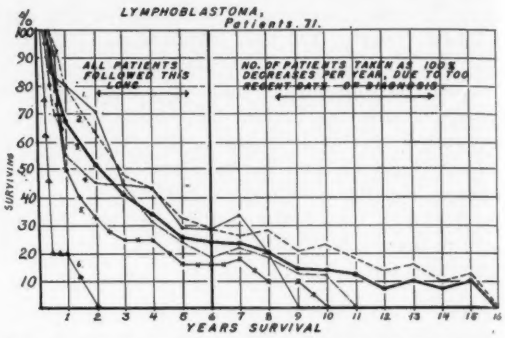

LYMPHOBLASTOMA, Patients, 71.
ALL PATIENTS FOLLOWED THIS LONG
NO. OF PATIENTS TAKEN AS 100% DECREASES PER YEAR, DUE TO TOO RECENT DATE OF DIAGNOSIS
SURVIVING
YEARS SURVIVAL

Fig. 1. The importance of typing lymphoblastoma patients is illustrated in the graph. Curve 1, the thin solid line, shows the follicular type; curve 2, dashed line, lymphocytic type; curve 3, heavy solid line, average survival for "lymphoblastoma"; curve 4, dash-dot line, lymphoblastic type; curve 5, barbed wire line, lymphoblastic plus lymphocytic type; and curve 6, solid line with the triangle, reticulum or stem cell type.

the various types are follicular, 28.6 per cent; lymphocytic, 32.2 per cent; lymphoblastic, 25 per cent; lymphoblastic plus lymphocytic, 16 per cent; reticulum or stem cell, nil; and the average for the group, 25.5 per cent. The percentage of survivals for 10 years are lymphocytic, 22 per cent; lymphoblastic, 12 per cent; and for the group, 14 per cent.

Figure 2 shows that Hodgkin's disease has a five year survival rate of 47 per cent; lymphoblastoma,

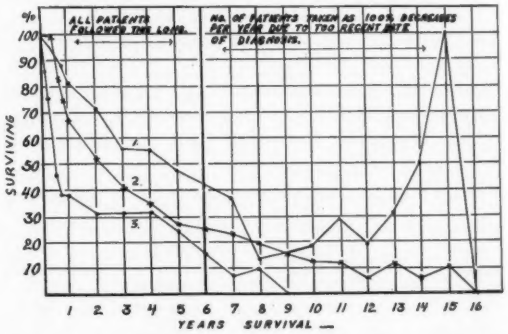

ALL PATIENTS FOLLOWED THE LONG.
NO. OF PATIENTS TAKEN AS 100% DECREASES PER YEAR DUE TO TOO RECENT DATE OF DIAGNOSIS.
SURVIVING
YEARS SURVIVAL

Fig. 2. The graph illustrates the survival rate from lymphosarcoma, Hodgkin's disease type (17 patients) on curve 1; from lymphoblastoma (71 patients) on curve 2; and from chronic lymphatic leukemia (13 patients) on curve 3.

25.5 per cent; and chronic lymphatic leukemia, 23 per cent; and the 10 year survival rate in the same order is 18 per cent, 14 per cent, and nil.

Figure 3 compares the survival of the lymphoblastoma group with that of normal life expectancy at the age of 50 years. The average age of the lymphoblastoma group was 49.5 years. Only this group was

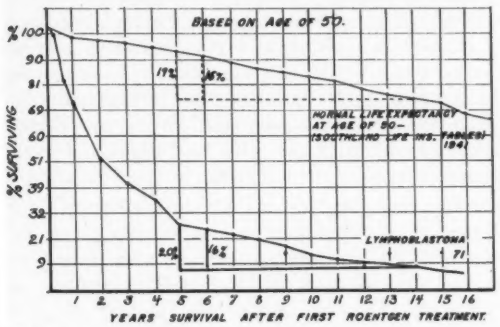


Fig. 3. A comparison of lymphoblastoma (71 patients) and normal life expectancy is shown in the graph. The slope of both curves becomes the same (16 per cent) at six years.

compared as it represents 71 cases; the other types have too few cases to indicate a trend—and that is all that is indicated here. For the normal life expectancy curve (constructed after the method of Joseph Berkson[1] the slope after five years is 19 per cent, whereas that for the lymphoblastoma group is 20 per cent. But at six years the slope of both curves becomes the same—16 per cent. This means that if a patient with a diagnosis of lymphoblastoma—and this statement is modified by the variations within the lymphoblastoma group as shown in figure 1—survives for six years, he can look forward to a normal life expectancy, especially if his age at diagnosis approximates 50 years.

COMPARATIVE COMMENTS

The comparisons in table 7 are not strictly justified as all the selective criteria for various reports are not exactly the same. There is also much room for variation in judging the pathology between the institutions. Only the more recent reports of some of the larger treatment centers are briefly reviewed.

Table 7 shows that in lymphoblastoma, the method of roentgen therapy used in our series compares favorably with those institutions having the highest gross survival rates. The Columbia-Presbyterian[7] report of 1950, with its added criterion of "symptom free," shows that many patients surviving five years will survive to 10 years, which is in agreement with the life expectancy curve (fig. 3) herein reported.

Table 8 also shows that in Hodgkin's disease the method of roentgen therapy used in this series compares favorably with the higher gross survival rates recorded for the five year survivals; however, it is

TABLE 7.—*Lymphoblastoma Gross Survival Rates.*

Institution	No. in Series	Survived 5 Yr. (%)		No. in Series	Survived 10 Yr. (%)
Columbia-Presbyterian[8]					
1947	96	22.6		12	12.8
1950[7]	242	20.6	← Symptom free →	172	20.9
University of Chicago[2]					
1948	43	9		43	2.3
University of Minnesota[4]					
1951	44	18.2		13	8*
Scott and White Clinic					
1956	71	25.5		43	14

*Figure excludes follicular type.

TABLE 8.—*Hodgkin's Disease Survivals.*

Institution	No. in Series	Survived 5 Yr. (%)		No. in Series	Survived 10 Yr. (%)
University of Chicago[2]					
1948	91	21			5.5
Columbia-Presbyterian[7]					
1950	133	11.3	← Symptom free →	118	9.3
Toronto General Hospital[6]					
1950	113	51		113	32
University of Minnesota[5]					
1954	208	25		167	11
Walter Reed General Hospital[3]					
1955	216	37		216	6
Scott and White Clinic					
1956	17	47		11	18

*Excludes follicular type.

less than the 10 year survival rate as reported by the Toronto General Hospital,[6] theirs being 32 per cent, which is by far the highest recorded. Again, the Columbia-Presbyterian[7] series has the symptom free requirement and shows a five year survival rate of 11.3 per cent and a 10 year rate of 9.3 per cent, indicating that patients surviving five years and being symptom free have an excellent chance of surviving 10 years as far as their Hodgkin's disease is concerned.

TABLE 9.—*Chronic Lymphatic Leukemia Survivals.*

Institution	No. in Series	Survived 5 Yr. (%)	No. in Series	Survived 10 Yr. (%)
University of Chicago[2] 1948	35	23	no data	
Scott and White Clinic 1956	13	23	6	0

Table 9 reveals that there is a 23 per cent five year survival rate in chronic lymphatic leukemia and nil for 10 years.

Tables 10 and 11 are a breakdown of the survivals according to sites on admission (Columbia-Presbyterian and Scott and White Clinic) or clinical stage (the others). These two methods of criteria for comparative purposes are roughly correlated, although they are not truly equivalent.

TABLE 10.—*Lymphoblastoma: Survival According to Sites on Admission.*

Sites on Admission	Columbia-Presbyterian[7] (Symptom Free) 1950	Scott and White Clinic 1956
	5 Year Survivals	
1	20 of 37 = 54%	3 of 9 = 33.3%
2	18 of 70 = 25.7%	3 of 14 = 21.4%
3	12 of 135 = 9%	9 of 48 = 18.8%
	10 Year Survivals	
1	12 of 26 = 46.1%	0 of 3 = 0%
2	15 of 35 = 42.8%	2 of 13 = 15.4%
3	9 of 111 = 8.1%	4 of 27 = 14.8%

Study of the results in tables 10 and 11 clearly shows that the lower the number in clinical staging, the higher the survival rate for all forms of lymphosarcoma. This is to be expected as the more generalized a disease is at onset of treatment, the shorter is the expected survival time.

There is rather consistent agreement in results that radical, that is, intensive, roentgen therapy gives higher survival rates in stage 1 than palliative routine. The same trend holds true for radical versus palliative therapy in stage 2. The results of the essentially palliative method of treatment used in this study compares favorably for stage 3, but this may not be strictly true because of the variations in selective criteria.

Comparing the Toronto General Hospital[6] and University of Minnesota[5] results in Hodgkin's disease, table 11, the survival rates are seen to be very similar, with the edge in favor of the University of Minnesota. The staging is similar in both of these series. A study of table 12 shows that both institutions give intensive roentgen therapy with a tumor dose of 2,000 r in 2 weeks for stage 1 and in 3 weeks for stage 2. Both institutions give palliative type of therapy for stage 3. The Toronto General Hospital gives only prophylactic therapy to adjacent uninvolved areas. Their hospital's stage 1 survivals are only 3 per cent better for five years and 2 per cent better for 10 years than the University of Minnesota's results. However, the latter institution shows significantly better results in stage 2, but again, this may reflect selective criteria. More data should be accumulated before accepting prophylactic therapy to adjacent areas as a routine.

The clinical staging used is that of Peters of the Toronto General Hospital[6] and is as follows (the original article gives further refinements incorporating symptomatology):

Stage 1: Involvement of a single lymph node region or a single lesion elsewhere in the body.

Stage 2: Involvement of two or more proximal node regions of either the upper or lower trunk.

Stage 3: Involvement of two or more lymph node regions of both upper and lower trunk.

TABLE 11.—*Hodgkin's Disease: Survival According to Sites on Admission.*

Stage or Site on Admission	Columbia-Presbyterian[7] (Symptom Free) 1950	Toronto General Hospital[6] 1950	University of Minnesota[5] 1954	Walter Reed General Hospital[8] 1955	Scott and White Clinic 1956
		5 Year Survivals			
1	26.6%	88%	85%	50%	Insufficient
2	9%	72%	90%	43%	number of
3	6.2%	9%	10%	32%	cases
	(133 cases)	(113 cases)	(208 cases)	(216 cases)	(17 cases)
Gross	11.3%	51%	25%	37%	47%
		10 Year Survivals			
1	26.9%	79%	77%	12%	
2	5%	21%	35%	9%	
3	4%	0%	2%	4%	
	(118 cases)	(113 cases)	(167 cases)	(216 cases)	(11 cases)
Gross	9.3%	32%	11%	6%	18%

Comparing clinical staging survival rates between institutions is far more accurate than comparing the gross survival rate, as the number of cases per stage per institution can differ tremendously and thus vary the weighting of the final gross survival rate (emphasized in table 11).

sarcoma. Hodgkin's disease has the best prognosis. The prognosis becomes progressively poorer in the following order: lymphocytic type; follicular type; chronic lymphatic leukemia type; lymphoblastic type; lymphoblastic plus lymphocytic type; reticulum or stem cell type; and lymphoblastic plus lymphocytic plus follicular type (fig. 1). The more the mixture of types in a patient, the poorer is the prognosis.

TABLE 12.—*Roentgen Therapy Factors.*

Institution	KVP	Filtration	Hvl mm. Cu	Ma.	FSD cm.	Aim
Columbia-Presbyterian[7] 1950		Not mentioned				Stage 1—T.D. of 3,000-5,000 r in 6 wk. 2—T.D. of 2,000-3,000 r. 3—T.D. of 1,000-1,500 r also to recurrences, rate of about 200 r/day (in air).
University of Chicago[2] 1948	200	1 mm. Cu 1 mm. Al	1.5			T.D. 2,000-4,000 r in 10-30 days (non-prophylactic).
University of Minnesota 1951[4]	220	0.5-1 mm. Cu	1.35-1.8	15	60-70	T.D. approx. 2,000 r in 14 days (stage 1); approx. 2,000 r in 21 days (stage 2); palliative to stage 3.
1954[6]	220	0.5 mm. Cu & 1 mm. Al	1.35		60	
Toronto General Hospital[6] 1950	400	0.6 mm. Sn	4.5	5	100	T.D. 1,800-5,000 r depending on stage and resistance to irradiation.
	200	0.2 mm. Sn	1.2	5	50	T.D. 400-800 r to adjacent uninvolved regions, depending on age and patient tolerance.
Walter Reed General Hospital[8] 1955		Not mentioned				T.D. of 1,500 r in 1 wk. to 2,500 r in 3 wk. and up to 4,000 r in more resistant cases. Supervoltage helpful in deep-seated lesions.
Scott and White Clinic 1956	200	1 mm. Cu & 1 mm. Al	1.68	18	50	600 r (in air) total/port in 2 days to superficial nodal areas. 1,140 r (in air) total/port at 240 r per day to deep lesions according to patient tolerance.

SUMMARY AND CONCLUSIONS

We have presented 101 cases of lymphosarcoma, excluding mycosis fungoides. All cases had pathologic proof which was rechecked. Roentgen therapy of 200 kilovoltage peak range and half value layer of 1.68 mm. of copper was the definitive treatment given. Results are compared briefly with several other institutions.

Grading of the various types is useful, as the lower the grade the higher the survival rates for both the 5 and 10 year surveys in the various categories except for Hodgkin's disease, in which this trend is reversed (tables 5 and 6).

Clinical staging is more important than pathologic grading, as it reflects more accurately the survival trends in the effectiveness of therapy. It is more accurate to compare the survival rates of the various stages between institutions than to compare the gross survival rates (table 11). The lower the clinical stage, the better is the prognosis in all types of lymphosarcoma.

Typing is useful as regards prognosis in lymphosarcoma. The older age group tolerates its disease better in the lymphoblastic, follicular, and chronic lymphatic leukemia types. The younger age group tolerates Hodgkin's disease better than the older.

If a patient is going to die of his disease, he is apt to do so soon and usually within three years of diagnosis.

If no additional fields are required within six months of the original treatment, the prognosis improves for the lymphocytic, lymphoblastic, and follicular types but is of little significance in the other categories.

In general, if a patient survives five years and needs no roentgen treatments for the last year, his prognosis improves.

If a patient, of approximately 50 years, with lymphoblastoma survives six years after initiation of roentgen therapy, he may look forward to a normal life expectancy.

The best treatment program from this study appears to be for stage 1—a tumor dose of 2,000 r in 14 days; for stage 2—a tumor dose of 2,000 r in 21 days; and for stage 3—a tumor dose of 570 r in two days to superficial nodes, and a tumor dose of 1,100

r in 10 days, according to patient tolerance, to deep lesions. Stage 3 routine is repeated as is clinically indicated.

REFERENCES

1. Berkson, J., and Gage, R. P.: Calculation of Survival Rates for Cancer, Proc. Staff Meet., Mayo Clin. 25:270-281 (May 24) 1950.
2. Hamann, A.: External Irradiation with Roentgen Rays and Radium in Treatment of Human Leukemias, Lymphomas, and Allied Disorders of Hemopoietic System, Radiology 50:378-385 (March) 1948.
3. Healy, R. J.; Amory, H. I.; and Friedman, M.: Hodgkin's Disease; Review of Two Hundred and Sixteen Cases, Radiology 64:51-55 (Jan.) 1955.
4. Nice, C., and Stenstrom, K. W.: Treatment of Lymphosarcoma, Bulletin of the University of Minnesota Hospitals and Minnesota Medical Foundation 22:420-428 (April 13) 1951.
5. Nice, C. M., and Stenstrom, K. W.: Irradiation Therapy in Hodgkin's Disease, Radiology 62:641-653 (May) 1954.
6. Peters, M. V.: Study of Survivals in Hodgkin's Disease Treated Radiologically, Am. J. Roentgenol. 63:299-311 (March) 1950.
7. Portmann, U. V.: Clinical Therapeutic Radiology, New York, Thos. Nelson & Sons, 1950, Chapter 29 by M. Lenz, J. Wells, and A. P. Stout.
8. Stout, A. P.: Results of Treatment of Lymphosarcoma, New York State J. Med. 47:158-164 (Jan. 15) 1947.

Dr. Nichols, Department of Roentgenology, King's Daughters Clinic, Temple.

Dr. Phillips, M. D. Anderson Hospital for Cancer Research, Houston.

Dr. Sommer, Department of Radiology, Scott and White Clinic, Temple.

ABSTRACT OF DISCUSSION

DR. ROBERT N. COOLEY, Galveston: The results which have been presented, with the possible exception of those relating to lymphatic leukemia, compare favorably with those obtained from other large centers, where much thought has been given to the management of these disorders. This is particularly so when we consider long term and five year survivals. In the lymphosarcoma group consisting of 71 patients treated, 17 were alive at five years and 10 of these were stage 3 cases at the time treatment began. Of the total number of stage 3 cases both of Hodgkin's disease and lymphosarcoma more than 18 per cent survived five years or longer. These results are much better than any that I have heard about. On the other hand the results in the stage 1 and stage 2 cases are quite acceptable but comparatively not so good. This minor discrepancy brings up another question. Although treatment courses were frequently repeated and as many as 15 courses were given to some patients, the highest dose given to any one field during any one treatment course did not exceed 1,520 r as measured in air. Usually it was somewhat lower. Although the arrangement of fields is not known, it is likely that the tumor dose for any one of these sites would not have exceeded this figure and in most instances it would have been lower. Measured by present day standards and practice this is a conservative dosage. It is considerably lower than that usually given in the earlier stages of these diseases. Consequently should we reappraise and readjust our thinking about dosage, or is it possible that the conservative dosages are more suitable for the stage 3 cases but not optimum for the earlier stage 1 and stage 2 cases in which we might hope for prolonged palliation? In this connection I should like to present a single case which serves to illustrate to some degree my basic philosophy concerning the treatment of lymphomas.

The case is of a young patient in whom a mediastinal mass was found on a routine chest film. The patient would not submit to thoracotomy, and a diagnostic dosage of roentgen rays was given. Following the administration of 1,200 r in approximately two weeks there was a rapid regression in the mediastinal mass. Because of this regression it was thought that this was a lymphoma and further treatment was instituted. The mediastinal mass was given a tumor dose of approximately 2,750 r in a period of four weeks. This dosage was given through two opposing 22.5 by 15 cm. fields. The upper end of the fields reached to the level of the clavicle and apparently encompassed the entire mediastinal mass and adjacent areas. About two weeks after the completion of treatment, the mediastinal mass had almost completely disappeared. The patient by this time was aware that he probably had a malignant tumor and became something of a psychiatric problem. Finally he was persuaded to undergo an operation. At operation the mediastinal mass was found. The surprising finding was that the upper portion of the mass extended well into the lower cervical region and considerably beyond the upper portion of the clavicle. It was obvious that there was a part of this mass that was not included in the field of radiation. The section of the tumor taken from the radiated area showed an area of necrosis and most of the cells were shrunken. The pathologist believed that there was no viable tumor tissue left; however, a cellular tumor which was thought to be Hodgkin's disease was present. This cellular portion of the tumor was obviously beyond the field of radiation and therefore relatively undamaged. This might be said to be a geographic miss, but I believe that this occurs frequently in the lymphoma group because of the wide extension of these tumors. However, the most that can be hoped for from radiation therapy is to destroy the tumor locally. At least that is what I would attempt to do when I take one of these patients for treatment. Whether or not it can be done with less than 2,750 r in four weeks I do not know.

Dr. Nichols and his associates have brought out that grading of lymphomas may be correlated with survival times, and he has applied these observations on a rather large scale. This is the first extensive attempt at such a correlation that I know of. It should be mentioned, however, that the primary location of the disease is of considerable importance in this connection. Lymphosarcoma of the intestinal tract often gives a relatively good prognosis, whereas patients with retroperitoneal involvement do poorly.

In the evaluation of the effects of treatment of leukemia, or for that matter any of the lymphomas, the results can be presented as five year survivals, or perhaps a more significant yardstick is the average duration of life following treatment. Actually the most useful evaluation would be an estimation of the duration of useful life. The most important objective is to return the patient to a comfortable existence and to a condition where he will be an economic asset. This is the most crucial measure of our treatment efforts.

Some 30 years ago Minot made a study of the duration of life in patients with chronic myelogenous leukemia not treated with roentgen rays. In general they were treated only by symptomatic supportive therapy. The average duration was slightly over three years. In a comparative group of patients treated with roentgen ray the duration of life was about three and a half years. However, Minot drew attention to the fact that those patients treated by roentgen ray were much more comfortable and much more productive than those who were not treated. Herein lies our real contribution to these patients. In a recent series of cases of lymphatic leukemia reported by Lawerence and his associates, the average duration of life was four and one-tenth years, and this is considered by present day standards to be a very good result. It now appears that we are actually able to prolong the lives of patients with leukemia. Again I wish to emphasize that it is the duration of useful life, however, that matters.

Role of Supervoltage Radiation in Cancer Therapy

VINCENT P. COLLINS, M. D.

Houston, Texas

ALL WHO ARE ENGAGED in the practice of medicine will have occasion from time to time to tell a patient that, following an examination or biopsy, a diagnosis of cancer must be made. The cancer may be early and localized so that one may predict with some assurance that cure can result from conventional surgery or radiation. Some diagnoses carry an unfavorable prognosis by standard treatment methods, and additional measures or technical refinements are constantly sought to improve the patient's chances. Sometimes, it is evident that conventional forms of treatment have little chance of success, are simply not applicable, or have already failed.

Dr. Vincent P. Collins, who is from the Department of Radiology, Baylor University College of Medicine, presented this paper for the Section on Radiology, Texas Medical Association Annual Session, Galveston, April 24, 1956.

Supervoltage radiation seems to be an inevitable trend. It has a cosmetic advantage over lower voltage therapy with reduced radiation sickness, but the chance for cure of cancer is still limited by the accessibility and radiosensitivity of affected areas. It permits a bolder approach to certain lesions and may prolong useful and comfortable life.

Under these varying circumstances, questions concerning the role of supervoltage are apt to be asked. What are the advantages of supervoltage radiation? What are the limitations? What are the indications? The questions may be asked by the patient, by his personal physician, by the radiologist in practice, or by a hospital board of directors. Any of these may seek opinion from larger centers where such equipment is in use or from an institution where the need for such extension of radiation facilities has not been felt. The background and interest of those who seek and offer opinion may vary widely, and some divergence of views is only to be expected.

The term supervoltage is open to some objection because the prefix "super" is vaguely relative with a connotation that is not entirely appropriate to medical terminology. Megavoltage (millions of volts) is a more acceptable word paralleling the term kilovoltage (thousands of volts), which is in common use. Supervoltage, or megavoltage, applies to radiotherapy units which generate roentgen rays with an energy of 1,000,000 volts or more, and includes the cobalt-60 teletherapy unit which emits gamma radiation with maximum energy of 1,330,000 electron volts. In this country there are now four supervoltage x-ray generators commercially available, and several designs for units which utilize radioactive cobalt sources of high intensity.

ADVANTAGES

The advantages of supervoltage radiation lie in the physical characteristics of high energy radiation (table 1).

TABLE 1.—*Advantages of Supervoltage Radiation.*

Physical	Clinical
Maximum ionization is displaced below surface	Skin tolerance is increased
Greater penetration	Tumor dose is greater for a given skin dose
More uniform absorption	Diminished hazard of bone necrosis
Low integral dose in proportion to tumor dose	Patients tolerate radiation better. Less radiation sickness

There are several features which explain the displacement of maximum dose below the skin surface at the entrance portal. Ionization that occurs in any unit volume of tissue is due to primary radiation traveling in the direction of the roentgen-ray beam and to scattered secondary radiation entering the area from any direction as a result of interaction in adjacent tissue (fig. 1). At the skin surface the radiation effect will be due to the primary radiation and to secondary radiation scattered in a lateral or backward direction. Below the surface, the effect of radiation is increased by an additional component of secondary radiation which is scattered in a forward direction as well as laterally and backward (fig. 2).

One effect of the quality of radiation is on the range of scatter. With low energy radiation, scatter into a given area must come from the immediate vicinity. For high energy radiation, scatter into a given area can come from greater distances. Maximum effect will be reached near the surface for low

energy radiation; maximum effect will be reached deeper in the tissue for high energy radiation (fig. 3). Another effect of the quality of radiation is on the direction of scatter. High energy radiation tends

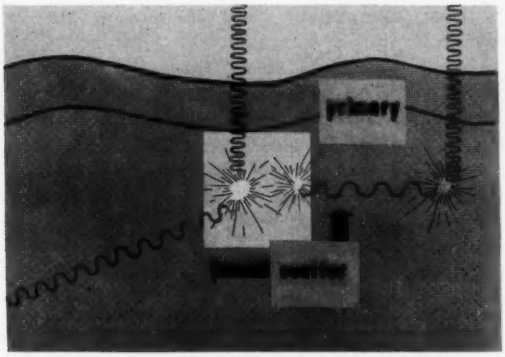


Fig. 1. Primary and secondary or scatter radiation.

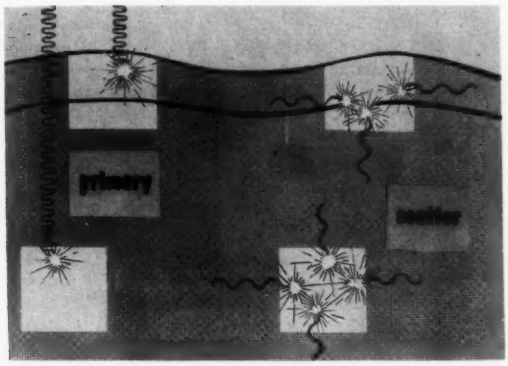


Fig. 2. Scatter radiation at a depth is increased by a forward component which cannot be present at the surface.

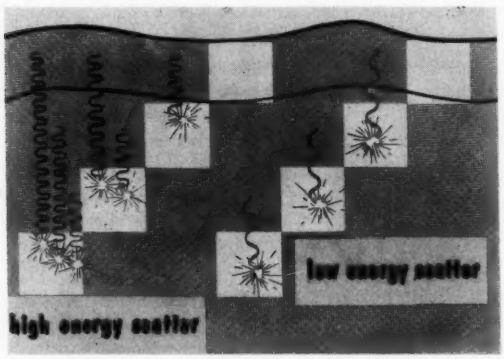


Fig. 3. High energy radiation increases the range of scatter so that maximum is reached deep in tissue.

to produce scatter that is dominantly in a forward direction so that there will be few interactions near the surface. Scatter from all directions occurs with

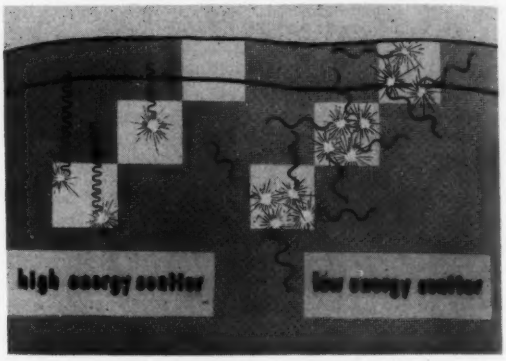


Fig. 4. The scatter of high energy radiation is predominantly in a forward direction, which also tends to increase the effect below the surface.

soft radiation, and more interactions can occur near the surface (fig. 4).

The effect of quality of radiation on depth dose is well demonstrated by a comparison of the "half value layer" in tissue. This term describes the thickness of tissue which diminishes the intensity of the radiation to one-half (fig. 5). Shallow and superficial for 100 kilovolt radiation, it is thicker for 250 kilovolt radiation, begins to sink below the surface at 2,000 kilovolts, and is deeply immersed with betatron radiation at 22,000 kilovolts.

It is desirable to spare the epithelial surface by avoiding erythema and moist desquamation, but deeper tissues may show late fibrosis as a high dose effect. It is not necessarily advantageous to displace the maximum effect ever deeper in the body since there are more vulnerable sites than subcutanous tissue. With the betatron, the maximum skin reaction may be a moist desquamation at the site of exit when the site of entrance shows little or no effect. This has no obvious advantage over a moist desquamation at the point of entrance, which is the common problem with intensive conventional roentgen radiation.

The more uniform absorption of high energy radiation is well demonstrated in a comparison of radiographs made with a conventional technique and at 2,000,000 volts (fig. 6). Bone is seen in an ordinary

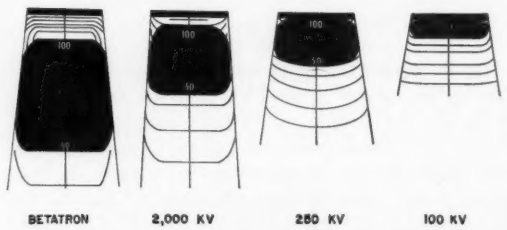


Fig. 5. Comparison of site and volume of maximum effect for different qualities of radiation.

radiograph because it absorbs roentgen ray and casts a shadow on the exposed film. In the 2,000,000 volt radiograph, bone can be seen only vaguely since it absorbs hardly more of the high energy roentgen ray than does soft tissue, producing no contrast and no image.

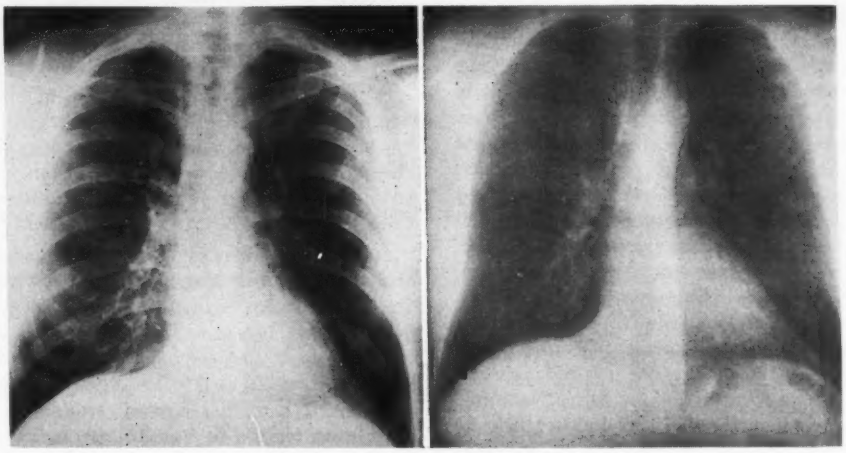


Fig. 6. In a conventional radiograph (left), the bony thorax is easily identified; in a radiograph made with 2,000,000 volt roentgen rays (right), bone can be seen only vaguely because it does not absorb more roentgen ray than soft tissues.

Integral dose or volume dose is an expression of the amount of radiation that the body absorbs in the course of treatment of a given lesion. For high energy radiation the greater penetration and the dominantly forward scatter mean that a desired tumor dose is achieved with less absorption in intervening tissues. Since there is little side scatter (fig. 7), the radiation is largely confined to the primary beam so that the volume of tissue being irradiated and the amount of radiation absorbed is kept to a minimum. That patients treated with supervoltage radiation are less subject to radiation sickness is believed to be related to less total energy absorbed during a course of therapy.

LIMITATIONS

The limitations of supervoltage radiotherapy are imposed by the nature of cancer. There are two principal reasons why treatment fails to cure:

1. The commonest cause of failure is the spread of disease beyond the treated area. Supervoltage radiation, conventional radiation, and surgery are equally ineffective if they cannot be applied to include all the sites of cancer. There is a tendency to overcome a language barrier by repeating a word more loudly. Raising the voice or raising the voltage will not overcome the problem if the factor lacking is understanding.

2. If the extent of the cancer is limited and known, there is still the problem of radiosensitivity. There is no evidence that any cancer is more sensitive to supervoltage radiation than to conventional radiation if all the other factors of dose are similar. Any greater response is due entirely to the amount of radiation that can be delivered by supervoltage radiation. The maximum benefit from conventional radiation is achieved in some instances at a high price of morbidity and complication.

Supervoltage facilities permit development of treatment policies in two directions. We may attempt to equal the best of present results and extend them to greater numbers of eligible patients while eliminating or diminishing the complications for treatment; or we may deliver higher doses in quest of a cancerocidal effect while inviting the same complications that mark the limits of tolerance to conventional radiation methods.

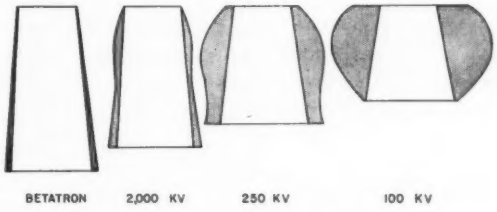


Fig. 7. Diagrammatic representation of the effect of quality of radiation on scatter from the primary beam into the adjacent tissue.

The choice between these policies is a matter of judgment. But supervoltage radiation is susceptible to discreditation if its availability is considered a mandate to deliver astronomical doses to cure cancer at any cost.

We recognize a group of cancers that we classify as early or curable because conventional methods of surgery and radiation have been generally successful. For these lesions, the advantages of supervoltage radiation may be applicable but not essential, and no great improvement could be expected. There is another group of patients with advanced disease who are not eligible for conventional therapeutic methods or who are discovered to be uncured following unsuccessful primary treatment. These are the patients whose need justifies the extension of cancer facilities such as supervoltage. These are the patients who will test the usefulness of supervoltage. In this unfavorable group there will be a disheartening similarity in the results of all forms of locally applied treatment as long as the criterion of success is cure. In a broad group of diseases, successful treatment is the management of the disease to maintain the patient in comfort and in economic and social usefulness. Much of cancer treatment is termed palliation, an accurate enough term which, however, has come to have a connotation of futility. No such sense of hopelessness or frustration besets the patient or the cardiologist in the management of coronary heart disease, which is, in fact, palliation in the strictest sense. For the patient we must recognize that progress in cancer therapy will be of the nature of improved management of patients with advanced disease. Whether or not this means an actual increase in survival time may be difficult to determine, but it will mean rendering the patient asymptomatic and returning him to a useful, social, and economic position with minimal disability due either to the disease itself or to morbidity associated with the treatment of the disease. Criteria for the effectiveness of therapy in this field must take these factors into account.

INDICATIONS

The indications for supervoltage therapy are dictated by the advantages and limitations that have been outlined, weighted by the general concept of cancer that the therapist has developed.

When both conventional and supervoltage facilities are available and adequate to all demands, the supervoltage facilities tend to be favored for reasons of convenience and comfort, even if the required tumor dose can be delivered by conventional methods. It has been found that 250 kilovolt therapy machines come to be limited in their use to those circumstances, such as superficial lesions, pain relief, and inflammatory conditions, for which the desired effect can be obtained by doses that are well within tolerance. The skin-sparing effect and the improved tolerance of supervoltage radiation are desirable for both the therapist and the patient.

There is an economic aspect in the diminished time and effort involved in the actual treatment schedule of the supervoltage unit. The complexity of treatment planning is reduced when patients may be treated with one, two, or three treatment fields as opposed to conventional techniques requiring four to six fields. The simplicity of treatment plans and the diminished number of fields reduce the time involved in setting up the patient for treatment. Except for the units of very low radiation output, the over-all treatment time is thereby reduced and the number of patients that can be treated is increased.

In certain instances such as advanced cancer involving bladder or lung, it may be questioned whether any treatment is indicated. Experience with conventional techniques and 250 kilovolt radiation leads to some doubt that the morbidity associated with intensive treatment is justified when the likelihood of appreciable benefit is remote. There may be strong indication for use of supervoltage radiation in such circumstances, as suggested in the following cases.

CASE 1.—A 63 year old relative of a urologist was discovered to have an inoperable cancer of the bladder. The fungating lesion involved more than half the bladder surface as seen at cystoscopy. The histologic diagnosis was transitional cell carcinoma, grade 3 with invasion of muscularis. Treatment was carried out with a 2,000,000 volt machine, using four fields 6 by 5 cm. A tumor dose of 5,000 r was delivered in four weeks. A severe cystitis was produced which began to subside two weeks after treatment. The patient was symptom free at six weeks after treatment and has remained so for five years. In this interval, a primary cancer of rectum has been discovered and an abdominoperineal resection carried out.

Although examination showed an advanced cancer of bladder, and the histology gave no indication that this lesion differed in any way from other fatal carcinomas, it is evident that the lesion was still localized to the treatment area. For such a localized lesion, it is possible that an equally satisfactory result might have been obtained by cystectomy, by radium or radon, or even by conventional radiation had these methods been offered. The important point is that they were not believed applicable because the chance of success was too remote and the risk of these forms of therapy too great. That the patient survived can be attributed to the technical advantages of supervoltage that rendered it feasible to undertake treatment with the therapist knowing that although chance of success was low, no formidable risk attended the course of therapy.

CASE 2.—A 57 year old man had an inoperable carcinoma of the upper lobe of the right lung involving the

right hilus. The outstanding feature in this instance was the hypertrophic pulmonary osteoarthropathy involving hands and wrists, feet and ankles. This distinctive form of arthritis, which is associated with several types of chronic pulmonary disease, made it difficult for the patient to walk or even use his hands to eat.

He was treated with 2,000,000 volt radiation using opposing 8 by 12 cm. fields to include the right hilus and the superior mediastinum. He received a dose of 5,000 r in four weeks in July, 1951.

The arthropathy was completely relieved two weeks after treatment was completed. The radiographic evidence of periosteal reaction disappeared after two months, and there was no recurrence of signs or symptoms. In September, 1952, the patient developed paralysis of the right vocal cord, and in November of the left vocal cord. It was evident that there was recurrent disease in the right hilus and in the mediastinum. He was treated again with 2,000,000 volt roentgen therapy, receiving 5,000 r in four weeks to the involved region. There was temporary improvement, but respiratory distress recurred, and he died in March, 1953, 20 months after the first course of therapy.

Carcinoma of lung is, in almost all instances, incurable because of metastases to the mediastinum and beyond the thorax. Supervoltage radiation cannot alter cure rates under these circumstances. As with conventional radiation, it can have its effect only where it is applied, and it can be applied most effectively only when the site of involvement can be identified. There are, however, real benefits in the control of cancer in localized areas as in this case. Such effects are obtained with conventional equipment only if the lesion is very sensitive or if multiportal techniques are employed. In a review of 100 consecutive lung cancers treated in a radiotherapy department prior to installation of supervoltage equipment, it was noted that only 3 patients had received a tumor dose of 4,000 r or more. In the light of more recent experience it is likely that some among the remaining 97 patients would have had increased survival and diminished morbidity had it been feasible to offer them adequate radiation at minimum risk by supervoltage techniques.

When only conventional equipment is available, the question may arise whether supervoltage radiotherapy at some distant treatment facility should be considered. This is a complex problem in which the likelihood of physical benefit and possibility of comfort in mind to the patient must be weighed against hardship and disappointment that may result for both patient and family. Decisions that the physician must make for his patient are not wholly governed by radiobiology and cancer statistics.

If local facilities for conventional radiotherapy have proved adequate in comparable cases in the past, the basis for considering supervoltage will be for skin-sparing cosmetic effect and for the possible greater comfort of the patient.

If the patient's problem is of a type that has not been found to respond favorably to available facilities in the past, supervoltage radiation should be considered more seriously. The probability of benefit must be estimated on the basis of experience in similar cases, taking into account other recourses that are open to the patient, and the judgment of the patient's personal physician as to appropriate action.

The question as to whether a supervoltage unit should be obtained may be raised where radiotherapy facilities are being considered for installation, replacement, or extension. The trend of equipment is evidently in the direction of supervoltage. The factors that give some pause to such a commitment are both economical and medical. The cost of equipment, construction, and installation is high, and the economic return is not obviously greater than with conventional equipment. The increased potential for delivery of greater tumor dose is also an increased potential for greater radiation damage at a depth. This is attended by an increased responsibility to provide adequate personnel to undertake the safeguards of applied radiologic physics.

There are a number of developments such as the automobile, the airplane, and television that steamroller their way from the inevitable to the indispensable even if we doubt the value of their contribution to our total welfare.

Supervoltage was inevitable 20 years ago. The following excerpts are from an article by Leucutia and Corrigan[1] published in 1934:

All in all, it appears clear from the foregoing that the advances of the last few years have contributed enormously to the betterment of practical radiation therapy. In a time of such rapid progress, however, it is inevitable that a certain confusion here and there should arise. . . .

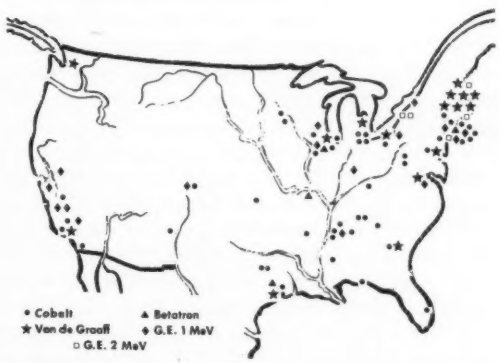


Fig. 8. Distribution of supervoltage units in the United States.

. . . The more deep-seated lesions, however, had to continue to remain untreatable until about 1920 when, finally, through modernization of roentgen engineering principles, the so-called "deep roentgen therapy" with 200 kv. was introduced. This, then, at once gave such an impetus to the whole art of the clinical application of radiation that the

subsequent decade must be considered as the most fertile in the history of the entire science of radiology. . . .

. . . Every irradiation acting more or less as a local agent, although in a considerably broader sense than an operation, will fail to bring about a control of the malignant process whenever a widespread generalization has already taken place. For this reason, super-high voltage roentgen therapy, while it may be expected to lead to decided improvement in the end-results . . . will not prove a panacea for the cancer problem as a whole.

If not indispensable, supervoltage is at least inescapable now. Of approximately 100 units now in use in this country, half have been installed in the past two years, and the number is likely to be doubled in the next two years (fig. 8).

CONCLUSIONS

Supervoltage represents an advance in the field of radiotherapy comparable to the contributions that modern anesthesia, antishock therapy, and antibiotics have made toward extending the application of surgery. While improvements of this type do not guarantee more cures, they do mean that the chance for cure at diminished risk can be offered to patients who might otherwise be denied such a chance. If a technique for thoracotomy or laparotomy should be developed which did not require a skin incision, this would produce an immediate revolution in surgical technique without an anticipated change in the effectiveness of surgical treatment. Radiotherapy by supervoltage techniques might be compared to nonincisional surgery. It permits a bolder approach and a decided cosmetic advantage, but the chance for cure is still proscribed by metastases beyond the area accessible to resection or adequate radiation.

Present methods are not too unsatisfactory for the early or operable cancers. It is in the field of incurable or inoperable cancer that advances are demanded. It must be expected that success in this field, within the forseeable future, will be in the nature of improved management short of cure, so that the patient is maintained for the greatest period of time, free of symptoms or incapacitation. The importance of this goal should not be underestimated. The alchemists of old sought an elixir of life so that man might never grow old. If they never found this, still they did not entirely fail, for their efforts continued in the name of medical research, which has increased life expectancy threefold in the past 300 years.

REFERENCES

1. Leucutia, T., and Corrigan, K. E.: Present Status of Roentgen Therapy with Voltages Above 200 Kv.; Technical Development and Medical Application Am. J. Roentgenol. 31:628-662 (May) 1934.

◗ Dr. Collins, 1200 M. D. Anderson Blvd., Houston.

Surgical Management of Thyroid Disease

MALCOLM E. WHITE, M. D.

Orange, Texas

and NORMAN DUREN, M. D., F.A.C.S.

Beaumont, Texas

THE PURPOSE of this paper is to present a brief review and discussion of 124 thyroidectomies performed over a period of years in southeast Texas. In practically all cases, the surgery was performed and the preoperative and postoperative care managed by one surgeon (N. D.).

Dr. Malcolm E. White and his co-author are general surgeons.

Among 124 thyroidectomies about 21 per cent were for diffuse toxic goiter, 69 per cent for nodular goiter, 10 per cent for inflammatory goiter; none was for diffuse nontoxic goiter. Solitary thyroid nodules are often malignant but cannot be differentiated clinically from benign nodules. Recommendations concerning management of the various thyroid disturbances are noted.

TYPES OF GOITER

When dealing with enlargements of the thyroid gland, we have used the following classifications: diffuse nontoxic (simple colloid) goiter, diffuse toxic goiter (Graves' disease), nodular goiter, and inflammatory goiter.

Diffuse Nontoxic Goiter.—The diffuse nontoxic goiter is the simple colloid goiter. These enlargements of the thyroid occur when there is a relative or absolute deficiency of iodine. They are seen when there is an increased demand for thyroid hormone such as during puberty and adolescence, pregnancy, and the menopause. The thyroid gland responds to

iodine deficiency with hyperplasia followed by involution. Histologically, the follicles of the gland are enlarged and filled with colloid, and the epithelium is cuboidal or flattened. The treatment of the diffuse nontoxic goiter is not surgical unless, over a period of months or years, it becomes large enough to be unsightly or causes pressure on the trachea and recurrent laryngeal nerves.

Diffuse Toxic Goiter.—The diffuse toxic goiter or Graves' exophthalmic goiter has caused much discussion as to its etiology. It is believed that there is a disturbance in the thyropituitary axis with an over production of the follicle stimulating hormone of the pituitary. The increase in follicle stimulating hormone causes hyperplasia of the follicular elements of the thyroid with an increase in thyroid hormone production. Pathologically, the enlargement of the thyroid may be minimal. There is increased vascularity of the gland, and it is firm and "meaty" in consistency. Microscopically, there is marked hyperplasia and the follicles are lined with tall columnar cells with many papillary infoldings. Colloid is sparce, vacuolated, and pale. Often there are lymphocytes throughout the gland, and in some areas distinct germinal centers are formed.

The characteristic histologic picture of diffuse toxic goiter is changed somewhat by the administration of iodine and/or thiouracil, but because of limited space we will not discuss these changes.

The management of diffuse toxic goiter is surgical in most instances. Radioactive iodine probably should be reserved for older patients and for those who exhibit severe cardiac damage or other complications which place their condition in the hazardous group as far as surgery is concerned. Furthermore, it may be administered to younger persons who exhibit recurrent hyperthyroidism after one or more operations, especially if the patient has paralysis of a vocal cord, tetany, or some other technical barrier.

In the usual case of diffuse toxic goiter, the patient is prepared for surgery with propyl thiouracil followed later by Lugol's solution. The Lugol's solution is started about 7 to 10 days before surgery is performed. When the pulse rate has dropped to between 90 and 100 beats per minute and there is general improvement of the over-all clinical condition, a radical subtotal thyroidectomy is done. Both recurrent laryngeal nerves are exposed and protected during the procedure, and only a small amount of thyroid tissue is left on each side of the trachea. Great care is taken to avoid leaving a pyramidal lobe.

Although the determination of the basal metabolic rate has not been totally discarded, it has been found to be too inaccurate in determining when the patients are ready for operation. Therefore, we depend primarily on the decrease in the pulse rate and over-all clinical improvement before proceeding with surgery. In a few cases, it is necessary to hospitalize the patient for several days before surgery in order to check the sleeping pulse rate.

Nodular Goiter.—Nodular goiters may be associated with an excess, a normal amount, or a deficiency of thyroid hormone. Except in the cases of neoplasia, the nodularity is probably the result of unequal hyperplasia and involution within the gland. It is, of course, impossible to make a clinical distinction between a neoplastic goiter and one that is due to hyperplastic and involutional changes.

The nodular goiter associated with hyperthyroidism is managed much like the diffuse toxic goiter with propyl thiouracil, Lugol's solution, and subtotal thyroidectomy. These patients are frequently bad surgical risks, for they are usually older, have had goiter for several years, and often have auricular fibrillation, heart failure, or other degenerative diseases common to the older age groups.

There is a certain group of patients who present themselves with a nodule in the thyroid, but with no evidence of hyperthyroidism. When these nodules are examined histologically, they show a picture of hyperplasia that is indistinguishable from the diffuse hyperplasia seen in the diffuse toxic goiter. This finding has not been satisfactorily explained.

It has been stated that for all practical purposes, carcinoma does not occur with hyperthyroidism, but it should be pointed out that the presence of hyperthyroidism does not rule out the possibility of malignancy.

The problem of carcinoma, in the nodular goiter, is an important one. The solitary nodule is especially likely to be a carcinoma. The incidence of carcinomas in solitary nodules is reported to be 10 per cent by the Lahey Clinic (178 carcinomas in 1,971 solitary nodules). Oschner reported an incidence of 7.2 per cent of carcinoma in solitary nodules.

The benign neoplasms of the thyroid gland are made up of adenomas: the colloid adenoma, the fetal adenoma, and the Hürthle cell adenoma. Occasionally we find simple, degenerative, and dermoid cysts.

The malignant neoplasms of the thyroid are made up of papillary carcinoma (about 25 per cent), follicular adenocarcinoma (about 50 per cent), undifferentiated adenocarcinoma (about 20 per cent), Hürthle cell adenocarcinoma (about 5 per cent), and lymphoma.

The management of malignancies of the thyroid is surgical in all cases except those that are obviously inoperable at the operating table. When the lesion is well out into the lateral lobe with no lymph node involvement, a total lobectomy on the same side will be all that is necessary. If there is metastasis to the cervical nodes, a radical node dissection is done on the same side. If the lesion is near or involves the isthmus, a total lobectomy on the same side is done

with removal of the isthmus and a subtotal lobectomy on the opposite side.

In the cases of so-called lateral aberrant thyroid, which is considered to be a metastatic carcinoma in the lymph nodes, a radical node dissection and total lobectomy on the same side is done.

In the inoperable cases and in those in which resection of the lesion is incomplete, external irradiation may be advised. Treatment of the great majority of carcinomas with radioactive iodine is unsuccessful, for in most cases the neoplastic tissue will not take up the iodine.

Inflammatory Goiter.—The most important inflammatory conditions of the thyroid are subacute (granulomatous) thyroiditis, Hashimoto's struma lymphomatosa, Riedel's struma, and reactive thyroiditis. In most instances, the symptoms of thyroiditis are due to the presence of a goiter with compression of the surrounding structures. The diagnosis can be made preoperatively in many cases, and frequently no treatment at all is necessary. These patients should be observed at intervals for compression of the trachea and to exclude the possibility of overlooking malignant tumors. According to the Lahey Clinic, the best operative treatment is either partial resection of the gland or excision of the isthmus to relieve constriction of the trachea. Most patients with thyroiditis subsequently develop hypothyroidism regardless of how much thyroid tissue is removed.

PRESENT SERIES

For the 124 thyroidectomies done in this series, table 1 shows the distribution of cases as to diagnosis.

TABLE 1.—*Diagnoses in 124 Thyroidectomies.*

Type Goiter Diagnosed	Cases	%
Diffuse nontoxic	00	00
Diffuse toxic	26	20.96
Nodular	85	68.54
Inflammatory	13	10.48

Of the 26 diffuse toxic goiters, the youngest patient was 15 years of age and the oldest was 70. There were 20 females and 6 males. The pathologic diagnosis in 23 cases was diffuse hyperplastic goiter alone and in 2 cases, there were associated fetal adenomas. In 1 case, the diagnosis was diffuse hyperplastic goiter with thyroiditis. None of the diffuse cases showed associated carcinoma.

In the 85 nodular goiters, there were 10 carcinomas, an incidence of 11.76 per cent of the nodular goiters and an over-all incidence of 8.06 per cent of the 124 cases.

In the nodular group, 14 had symptoms of hyperthyroidism and 71 had no toxic symptoms. The youngest patient was 19 years of age and the oldest 72. Thirty-four of the 85 patients were above the age of 45 years, 48 were under the age of 45, and the age was not given in 3 cases. There were 82 females and 3 males in this group.

In the group that showed carcinoma, the youngest patient was 29 and the oldest was 59 years of age. There were 8 females and 2 males. Five of the carcinomas were papillary adenocarcinoma and 2 were papillary adenocarcinoma mixed with alveolar (follicular) carcinoma. There were 2 alveolar (follicular) carcinomas and 1 undifferentiated carcinoma. It probably should be emphasized that of the 85 patients having nodular goiters, there were only 3 males and 2 of these had carcinoma. Two of the 10 carcinomas were associated with lateral neck nodules.

In the thyroiditis group, of 13 patients, 11 had Hashimoto's disease, 1 Reidel's struma, and 1 subacute thyroiditis. Two of the cases of Hashimoto's disease were associated with adenomas. The oldest patient was 49 years of age and the youngest was 15. Nine of the 13 patients were between the ages of 15 and 40. There were 12 females and 1 male in this group. All of these patients had a clinical goiter, and in 5 cases a clinical diagnosis of thyroiditis was made. In the other 8 cases, the clinical diagnosis was either adenoma or "tumor" of the thyroid.

SUMMARY

One hundred twenty-four thyroidectomies are presented, and a brief review and discussion of goiters is given. The clinical preoperative classification that we use is presented.

The surgical management of the most important thyroid disturbances is discussed.

Emphasis is placed upon the fact that the solitary thyroid nodules are often malignant and that it is impossible to differentiate clinically between the benign and malignant nodules.

Thyroiditis is primarily a nonsurgical condition except in the later stages when constriction of the trachea may occur. In most instances, surgery is done to rule out a malignant process.

REFERENCES

1. Anderson, W. A. D.: Pathology, St. Louis, C. V. Mosby Co., 1948.
2. Beahrs, O. H., and Judd, E. S., Jr.: Symposium on Surgical Aspects of Cancer Problem; Malignant Lesions of Thyroid Gland, S. Clin. North America 31:1169-1177 (Aug.) 1951.
3. Haines, S. F.: Treatment of Exophthalmic Goiter, New York S. J. Med. 54:2175-2179 (Aug. 1) 1954.
4. Judd, E. S., Jr.: Symposium on Some Aspects of Surgery of Endocrine Glands; Role of Surgeon in Thyrotoxicosis, S. Clin. North America 32:981-989 (Aug.) 1952.
5. Kyle, L. H.: Practical Therapeutics; Therapy of Hyperthyroidism, G. P. 7:69-76 (May) 1953.
6. Lahey Clinic: Surgical Practice of Lahey Clinic, Philadelphia, W. B. Saunders Co., 1951.
7. Oschner, A.; Bralliar, M. B.: and Carrera, G. M.: Carcinoma of Thyroid, Texas State J. Med. 51:737-748 (Nov.) 1955.

Dr. White, Green Building, Orange.
Dr. Duren, 315 Goodhue Building, Beaumont.

CASE REPORTS

Hypothyroidism In Infancy

Review of Changing Concepts, Illustrated by Case of Sporadic Goitrous Hypothyroidism

JOSEPH W. GOLDZIEHER, M. D., and ALBERT W. HARTMAN, M. D.

San Antonio, Texas

SEVERE hypothyroidism, whether designated as cretinism, juvenile myxedema, or by some other name, was one of the earliest endocrinopathies of childhood to be recognized. It has been studied for years by many clinicians in various parts of the world, but their contributions remained largely of a descriptive or therapeutic character, with little being added to our understanding of the basic nature of this disorder. The availability of radioactive iodine, and the greater insight into thyroid physiology which has resulted from its use, once more have focused attention on the problems of thyroid insufficiency in early childhood. Great strides have been made in the past few years with the use of this new diagnostic tool.

Radioactive iodine studies are increasing the understanding of iodine metabolism within the thyroid gland, including the causes of severe hypothyroidism. A case of a genetic defect of thyroidal iodine metabolism in a 20 month old infant with myxedema heart, retardation of bone age, anemia, and goiter without hernia, delayed dentition, developmental retardation, constipation, cretinism, or juvenile myxedema is reviewed.

A basic distinction must be maintained between those forms of hypothyroidism which occur in geographic areas of iodine deficiency and those which occur in territories where iodine is plentiful. The pathologic process which unfolds in the thyroid gland forced to function in an iodine-deficient environment is reasonably clear—the neonatal thyroid gland operating under these conditions is initially adequate, but because of continuous iodine lack it is subjected to unrelenting stimulation by high levels of pituitary thyrotropic hormone. As a consequence, the gland eventually undergoes exhaustion atrophy. Since the thyroid is known to function for many months in utero, it is obvious that various degrees of exhaustion atrophy may have developed by the time of birth. The rate at which clinical hypothyroidism appears depends largely on the ability of the individual thyroid gland to resist such exhaustion atrophy. When this occurs at a very early age, clinical cretinism is seen; if a modicum of thyroid function persists for a longer period of time, the disease is described as juvenile myxedema. Essentially, both diseases are simply time variants of the same condition.

Hypothyroidism in areas with a sufficiency of environmental iodine presents an entirely different problem. Two forms with relatively clear-cut etiology will be omitted for obvious reasons in the following discussion. The first of these is hypothyroidism consequent upon pituitary insufficiency as in pituitary infantilism; the second is iodine deficiency due to the intake of goitrogenic agents such as cabbage, rutabaga, sulfonamides, thiocyanate, perchlorate, or other antithyroid drugs. There remain two important types of sporadic neonatal thyroid insufficiency: (1) actual maldevelopment of the embryonic thyroid gland (therefore an athyreotic and certainly nongoitrous variety) and (2) an allegedly rare condition in which the thyroid is situated and developed normally, and in which goiter is apt to appear. That this condition is not as rare as might be supposed from the literature (only 32 cases of sporadic goitrous cretinism have been reported) is shown by the fact that 7 out of a group of 60 sporadic cretins studied by Wilkins and others[14] showed this condition. An interesting feature of this disease is the strong familial tendency noted by various observers.

Sporadic athyreotic cretinism was thought by some to be due to intrauterine thyroiditis with destruction of the gland. Whereas there is scant evidence for such a hypothesis, there is much to be said against it, and it is far more likely that this condition results from embryonal maldevelopment. With the help of tracer doses of radioiodine, the existence of this form of thyroid insufficiency is easily demonstrated, for there will be no accumulation of radioactivity over the thyroid area; furthermore, regions of radioactivity may be found at the base of the tongue or other sites where aberrant thyroid tissue is apt to remain in the course of development of the thyroid anlage. Thus the diagnosis of embryonic maldevelopment of the thyroid with accompanying hypothyroidism is no

Dr. Joseph W. Goldzieher, San Antonio, specializes in endocrinology and metabolism. His co-author, Dr. Albert W. Hartman, San Antonio, is a surgeon. Both men are associated with the Southwest Foundation for Research and Education.

longer a presumptive diagnosis, but one which can be proven conclusively with the simplest of radioactive iodine tracer techniques. Studies of this type in sporadic cretinism without goiter have changed our concepts of cretinism versus juvenile myxedema. Formerly, many workers considered these to be different conditions. Recently Hutchison and McGirr[5] have reported a series of their own patients and called attention to other studies in the literature which indicate that the difference in these conditions is simply a question of time. Patients with a total neonatal absence of thyroid tissue develop cretinism, whereas those who have remnants of functional thyroid tissue (aberrant or otherwise) postpone the development of severe hypothyroidism until these fragments, unable to keep up with the increasing metabolic demands of the growing organism, undergo exhaustion atrophy and cease to function.

The second group of neonatally hypothyroid children, those in whom thyroid tissue is present and often goitrous, is perhaps even more interesting from the viewpoint of thyroid pathophysiology. In order to clarify the nature of the defect in these patients, it may be well to review briefly our present concepts of the nature of iodine metabolism within the thyroid gland. In their simplest terms, the transformations of iodine after it reaches the thyroid gland through the bloodstream are as follows (figure 1).

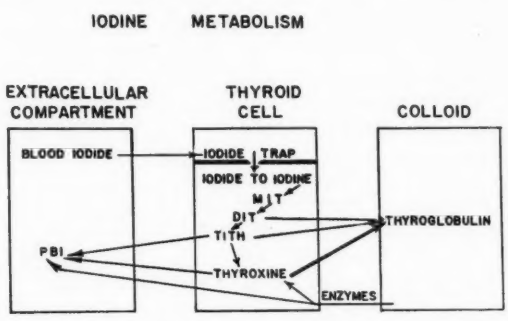


Fig. 1. Diagram showing iodine metabolism as related to the thyroid gland.

1. *Trapping of iodide.* Normally, iodide is taken up rapidly and concentrated as such within the gland. Such stored iodide may be discharged rapidly from the "iodide trap" by agents like thiocyanate or perchlorate which, however, have no action on iodine once it is organically bound. The effect of an oral dose of potassium thiocyanate on thyroid radioactivity some hours after administration of a tracer dose of radioiodine is, therefore, an excellent test for measuring the amount of iodide converted to an organic form (that is, thyroid hormone synthesis) in a given time interval.[11]

2. *Conversion of iodide to iodine.* This is an enzyme-catalyzed oxidation, and apparently it is by interference with this mechanism that the thiourea group of drugs exert their antithyroid effect.

3. *Organic binding of iodine.* Formation of (a) mono-iodo tyrosine, then (b) di-iodo tyrosine, then (c) coupling of two di-iodo tyrosine molecules to form thyroxine, and finally (d) de-iodination of thyroxine to tri-iodo thyronine, which is the most active form of the thyroid hormone.

4. *Storage* of these organic iodine compounds in the colloid in association with thyroglobulin.

5. *Release* of the thyroid hormone(s) into the circulation.

From the clinical point of view, interference with thyroidal iodine metabolism at any of these stages yields the same result—a deficiency of circulating thyroid hormone, the development of clinical hypothyroidism, a demand for more thyroid hormone, and as a result, an increased excretion of pituitary thyrotropic hormone. This in turn would cause thyroid hyperplasia, clinically evident as goiter, and eventually secondary adenomatous changes within the goiter such as are known to occur as a result of chronic overstimulation by thyrotropin.

Under these circumstances, it is easy to see that there could be five distinct types of sporadic (eventually goitrous) neonatal hypothyroidism, depending on the point at which a defect in thyroidal iodine metabolism occurred.

No proven cases of a faulty iodide trap in neonatal hypothyroidism have been published.

An inborn failure to convert iodide to iodine has not been observed as yet, but already there are numerous instances of inability (usually familial) to convert trapped iodine to an organic form. Stanbury and Hedge[5, 9] have reported a number of goitrous hypothyroid patients in whom there was active uptake of tracer iodine, which could be discharged from the thyroid promptly by a dose of thiocyanate even after considerable intervals of time. In addition to this evidence of the inability to form organic iodine compounds, the protein-bound iodine (PBI) in the serum was shown to be low, and the PBI within the thyroid tissue also was at very low levels. Lerman and others[4] have also studied a patient who showed an 87 per cent uptake of the tracer dose of iodine but had a concentration of only 0.07 per cent iodine within the thyroid tissue—a level as low as that seen in iodine-deficiency goiters. Wilkins and others[14] have made similar observations.

Metabolic defects further along the chain of iodine metabolism also have been observed. Silverman and Wilkins[7] have described a 6 year old goitrous cretin who showed active uptake of tracer iodine; the radioactivity was not discharged by thiocyanate, indicating that organic binding occurred. That there was no extrathyroidal factor (such as a hypothetical inability

of the peripheral tissues to respond) was proved by a satisfactory clinical response to the administration of thyroid.

Some error in the synthesis of the iodine-containing hormone is strongly suggested by the group of patients reported by Hutchison and McGirr.[3, 6] In these hypothyroid children there was active uptake of tracer iodine, not discharged by thiocyanate. Furthermore, the plasma radioiodine (I^{131}) level was elevated in 8 of 10 patients, the serum PBI^{131} was elevated in 7 of 10. Evidently some protein-bound, iodine-containing substance was being produced and released by the thyroid, but whatever it was, it did not have the physiologic actions of thyroid hormone. Some chemical evidence also was obtained in these studies indicating that the substance in the plasma was neither thyroxine nor tri-iodothyronine. In a somewhat similar case reported by Stanbury and others[10] mono- and di-iodotyrosine actually were demonstrated in the blood, indicating an excessive formation and release of thyroxine precursors.

In one of the 4 familial goitrous cretins described by Hubble,[2] the thyroid was shown to contain thyroxine, and 70 per cent of the plasma radioactivity was protein-bound, apparently as thyroxine. In this case, the explanation of the hypothyroidism is not at all clear, unless one assumes (1) that the rate at which thyroxine was produced or released was inadequate or (2) that thyroxine could not be converted to tri-iodothyronine, the presumed active form of the thyroid hormone.

Lastly, Hamilton[1a] has reported a case which indicates failure in the last step of the chain—hormone release. Adequate radioiodine uptake was observed, and chemical analysis of the thyroid tissue demonstrated the presence of di-iodotyrosine and thyroxine. Thus it appears that the mechanism for releasing the hormone into the peripheral circulation was defective.

Recently, we had the opportunity of studying a case of juvenile goitrous hypothyroidism due to a defect of thyroid physiology.

CASE REPORT

CASE 1.—R. F., a 20 month old boy, was brought to our attention because of a mass in the neck noted two months previously by the mother. Birth and early development were normal; first teeth appeared within 6 months, and walking and talking were not delayed. Severe eczema during the first 3 months of life (controlled by a change in the diet) and excessive reaction to the usual immunizations gave evidence of an allergic status. At 9 months of age, anemia was noted and treated with indifferent success by means of oral preparations of liver, "multiple vitamins," and vitamin B_{12}. There was no history of constipation, susceptibility to infections, or sensitivity to temperature. The appetite was generally poor. The mother considered the child to be normally responsive, alert, and active.

Two siblings of the patient, one younger and one older, showed no goiter or other superficial evidence of thyroid disease. The maternal grandmother was said to have had some thyroid trouble of an unspecified nature. One paternal uncle was known to have thyroid enlargement; on investigation, his thyroidal iodine uptake, urinary I^{131} excretion, PBI^{131} conversion ratio, and saliva–serum protein I^{131} ratio were found to be in the euthyroid range. Examination with the scintiscanner revealed diffuse activity over the entire thyroid with increased uptake in 3 nodules. Thus there was no evidence of a familial metabolic defect in this patient.

Physical examination revealed an active, alert, exceedingly negativistic child, measuring 32½ inches in length and weighing 26 pounds. (The normal average values for this age are about 33½ inches and 27 pounds). The skin was soft and moist; no cyanosis was observed. The facies were normal with no cretinoid stigmas. The front upper teeth showed some notching, but dentition was otherwise normal for the age. The neck revealed a diffuse, firm enlargement in the thyroid area, apparently smooth and well defined (fig. 2). It was not possible to listen for bruit.

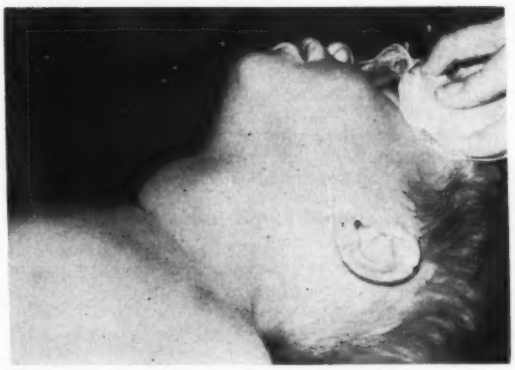


Fig. 2. A 20 month old boy with enlargement of the thyroid area.

The chest had a normal configuration; percussion and auscultation were resisted actively. There was no umbilical hernia, and no enlarged viscera could be palpated. The testicles were descended, and the penis was normal in size for the age.

Laboratory studies revealed red blood cell counts averaging 2,370,000 per cubic millimeter, hemoglobin values averaging 11.7 Gm. per 100 cc., and a white blood cell count of 6,200 with 20 per cent polynuclear leukocytes, 72 per cent lymphocytes, 5 per cent monocytes, and 3 per cent eosinophils. Prothrombin and coagulation times were normal. On one occasion, the urine showed a 1 plus albumin and occasional hyaline casts. Roentgen study of the chest revealed normal lung fields and definite enlargement of the heart (cardiothoracic ratio of 0.64) with diminished pulsations as seen on fluoroscopy. These findings suggested the possibility of myxedema heart or extreme dilatation, the latter being far less likely. Roentgenograms of the hands showed only the capitate and hamate bones present, and none of the epiphyseal centers for the bases of the phalanges had appeared. The distal epiphysis of the radius was absent, conforming to a bone age of less than 1 year. A tracer dose of iodine was administered; the activity distributed itself evenly over the thyroid area with an uptake of 30.4 per cent at 24 hours and 12 per cent at 48 hours. Thus was revealed a marked iodine "dumping" in the second 24 hour period. No thiocyanate test was performed.

On the basis of these findings, a clinical diagnosis of inborn error of thyroid metabolism with sporadic goitrous hypothyroidism was made. It was predicted that a hyperplastic gland, similar to that seen after thiouracil treatment, would be found. Surgery was performed under general and endotracheal anesthesia. Some adhesions were observed between the sternothyroid muscles and the thyroid gland. Exposure revealed a tremendous thyroid gland; the right lobe extended well back beneath the sternocleidomastoid muscle and almost completely encircled the trachea. The left lobe was not quite as large as the right. The recurrent laryngeal nerve and the parathyroids were identified and carefully preserved. Before excision, we performed an intra-arterial infusion of 10 microcuries of carrier-free I^{131} and collected blood from the severed venous supply. (Unfortunately, a technical accident destroyed this sample before studies on it could be completed.) The right lobe of the thyroid gland was removed in its entirety before the left lobe was mobilized. A similar procedure was then carried out on the left side. In view of the extensive surgery, both surgeon and anesthesiologist felt that a tracheotomy was indicated, and this was done accordingly.

The postoperative course was stormy and complicated by considerable respiratory difficulties requiring frequent suctioning of the tracheotomy tube. The child was kept in an oxygen tent using Alevaire for moisture. Following the intramuscular administration of 10 mg. of cortisone daily, there was abrupt improvement in respiration and pyrexia; after a week, oral administration in divided doses was substituted. The drug was tapered off and finally discontinued before discharge of the patient from the hospital on the twentieth postoperative day.

The specimen removed at operation consisted of a smooth, firm, grayish gland weighing 53 Gm. (fig. 3). The cut

Fig. 3. Right and left lobes of the thyroid gland removed from the patient.

surface was lobulated, resilient, and moderately firm. After fixation, the lobular areas protruded markedly above the fibrous septums. Sections from various portions of the gland showed the same pattern: The acini were irregular in shape, and almost all of them showed no lumen and only a solid mass of epithelial cells. A few irregular lumens without colloid and rarely an acinus containing pale pink colloid were found. The epithelial cells were large, with abundant pink, granular cytoplasm and fairly uniform oval to round nuclei (fig. 4). Occasional mitoses were present. No collections of lymphocytes were noted.

Fig. 4. Section of tissue from the removed thyroid gland showing irregularly shaped acini with no lumens and a solid mass of epithelial cells.

Blocks of tissue were frozen immediately in dry ice and were subsequently studied by Dr. J. B. Trunnell. The in vitro iodine metabolism studies on this material were performed by means of techniques already reported by his group.[13] Table 1 represents the result of these studies, as compared to thyroid tissue (unfrozen) obtained from 2 aborted human embryos. These studies yield further proof that the thyroid tissue from this patient apparently was unable to incorporate iodine into an organic form, although its capacity to trap iodide was unimpaired. The possibility that quick freezing the tissue accounts for the difference

TABLE 1.—*Percentage of Radioactivity in Iodine Metabolism Studies on Frozen Tissue from a 20 Month Old Patient and on Unfrozen Tissue from 2 Aborted Embryos.*

	Patient	17 Week Embryo	18 cm. Embryo*
Iodide	97.7	75.9	16.6
Monoiodotyrosine	0.8	11.8	43.3
Di-iodotyrosine	0.2	1.2	5.2
Thyroxine & thyroxine-like compounds	0.2	3.6	16.6

*Exact duration of gestation unknown.

between the goitrous thyroid and the other tissues with which it is compared is unlikely in view of the fact that cell-free thyroid juice can bring about organic binding, at least as far as monoiodotyrosine.[12]

Postoperatively, the child was maintained on 0.1 mg. of L-thyroxine daily. Attempts to increase the dose beyond this level resulted in restlessness and wakefulness. Bone age improved rapidly; by the time the child was 2 years 8 months old, the bone age had reached 2 to 2½ year level. Growth also accelerated considerably; in the third year of life, the patient's total growth was ½ inch in excess of the predicted growth rate of normal children. The cardiac outline showed slow but progressive change. Within the first six months after surgery and thyroxine, there was no change in the cardiothoracic ratio. Within the next six months, however, it decreased from 0.61 to a normal value of 0.50 (fig. 5). This of course confirms the original suspicion of myxedema heart, but offers no explanation for the great length of time required for the cardiac outline to diminish to normal.

DISCUSSION

This patient displays many features of exceptional clinical interest. The evidence favoring severe thyroid hypofunction—myxedema heart, retardation of bone age, anemia, and goiter—was unaccompanied by hernia, delayed dentition, developmental retardation, or even constipation to say nothing of actual cretinism or juvenile myxedema. Those who still cling to the all-or-none concept of hypothyroid symptomatology held by Means years ago might balk at calling this an instance of hypothyroidism. By way of reply, it might be pointed out that such a rigid concept has seldom survived in any syndrome; indeed, analogous dissociation of the severity of various symptoms already has been described in the hyperthyroid state.[1] It is also interesting that a well developed goiter already was present in this patient at the age of 20 months, whereas goiters usually have been reported to appear in such patients after the age of 5 years. One might speculate, by way of explanation, that this particular gland responded with unusual alacrity to pituitary thyrotropic stimulation.

Intensive study by means of radioactive iodine techniques may well alter the future management of such cases. If thyroid uptake studies were to demonstrate accumulation of radioiodine and subsequent iodine "dumping" with or without thiocyanate, and the determination of the serum PBI^{131} were to confirm the failure to synthesize thyroid hormone, then a therapeutic trial with L-thyroxine would be in order. In addition to alleviating the clinical signs and symptoms of hypothyroidism, such treatment would inhibit overproduction of pituitary thyrotropic hormone, interrupt overstimulation of the defective thyroid, and possibly prevent the subsequent development of goiter. Then, too, these studies in the presence of a goiter would serve to differentiate it from thyroid malignancy, which must be suspected whenever rapid thyroid enlargement occurs. Avoidance, or at least postponement, of such extensive surgery is of utmost importance, for total thyroidectomy at this age carries with it grave surgical risks. Last and least important, these patients offer a unique opportunity to explore anomalies of thyroid function, and consequently they deserve to be studied by every research tool at our disposal if we are to advance our knowledge of thyroidal iodine metabolism.

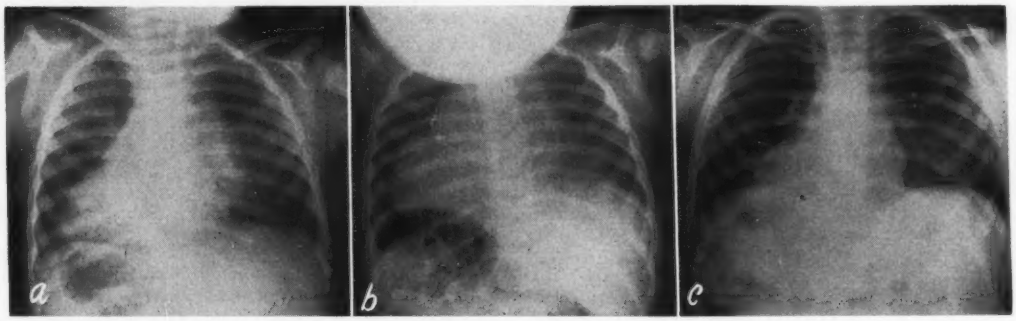


Fig. 5. Roentgenograms showing a decrease in the patient's cardiothoracic ratio which took place during the second six months following surgery for excision of the thyroid gland and tracheotomy.

SUMMARY

Present concepts of thyroid insufficiency in the infant have been reviewed, and an additional instance of a genetic defect of thyroidal iodine metabolism is reported.

REFERENCES

1. Goldzieher, M. H.; McGavack, T. H.; Peterson, C. H.; Goldzieher, J. W.; and Miller, H. R.: Retrobulbar Neuritis Associated With Hyperthyroidism, A.M.A. Arch. Neur. & Psychiat. 65:189-196 (Feb.) 1951.

1a. Hamilton, J. G.; Soley, M. H.; Reilly, W. A.; and Eichorn, K. B.: Radioactive Iodine Studies in Childhood Hypothyroidism, Am. J. Dis. Child. 66:495-502 (Nov.) 1943.

2. Hubble, D.: Familial Cretinism, Lancet 1:1112-1117 (June 6) 1953.

3. Hutchison, J. H., and McGirr, E. M.: Hypothyroidism as Inborn Error of Metabolism, J. Clin. Endocrinol. 14:869-886 (Aug.) 1954.

4. Lerman, J.; Jones, H. W.; and Calkins, E.: Studies on 2 Sporadic Cretinous Brothers with Goiter, with Remarks on Relation of Hyperplasia to Neoplasia, Ann. Int. Med. 25:677-701 (Oct.) 1946.

5. McGirr, E. M., and Hutchison, J. H.: Dysgenesis of Thyroid Gland as Cause of Cretinism and Juvenile Myxedema, J. Clin. Endocrinol. 15:668-679 (June) 1955.

6. McGirr, E. M., and Hutchison, J. H.: Radioactive Iodine Studies in Nonendemic Goitrous Cretinism, Lancet 1:1117-1120 (June 6) 1953.

7. Silverman, S. H., and Wilkins, L.: Radioiodine Uptake in Study of Different Types of Hypothyroidism in Childhood, Pediat. 12:288-300 (Sept.) 1953.

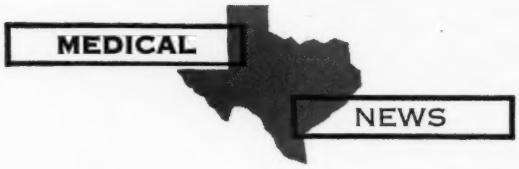
8. Stanbury, J. B.: Cretinism with Goiter; Case Report, J. Clin. Endocrinol. 11:740-742 (July) 1951.

9. Stanbury, J. B., and Hedge, A. N.: Study of Family of Goitrous Cretins, J. Clin. Endocrinol. 10:1471-1484 (Nov.) 1950.

10. Stanbury, J. B.; Kassenaar, A. A.; Meijer, J. W.; and Terpstra, J.: Occurrence of Mono- and Di-Iodotyrosine in Blood of Pa-

tient with Congenital Goiter, J. Clin. Endocrinol. 15:1216-1227 (Oct.) 1955.
11. Stanley, M. M., and Astwood, E. B.: Accumulation of Radioactive Iodide by Thyroid Gland in Normal and Thyrotoxic Subjects and Effect of Thiocyanate on Its Discharge, Endocrinol. 42:107-123 (Feb.) 1948.
12. Taurog, A.; Potter, G. D.; and Chaikoff, I. L.: Conversion of Inorganic I^{131} to Organic I^{131} by Cell-Free Preparations of Thyroid Tissue, J. Biol. Chem. 213:119-134 (March) 1955.
13. Trunnell, J. B., and Wade, P.: Factors Governing Development of Chick Embryo Thyroid, J. Clin Endocrinol. 15:107-117 (Jan.) 1955.
14. Wilkins, L.; Clayton, G. W.; and Berthrong, M.: Development of Goiter in Cretins Without Iodine Deficiency; Hypothyroidism Due to Apparent Inability of Thyroid Gland to Synthesize Hormone, Pediat. 13:235-246 (March) 1954.

◗ Dr. Goldzieher, 1133 Medical Arts Building, San Antonio. Dr. Hartman, 1202 Nix Professional Building, San Antonio.



★ Coming Meetings

Texas Medical Association, Dallas, April 27-May 1, 1957. Dr. Milford O. Rouse, Dallas, Pres.; Mr. C. Lincoln Williston, 1801 North Lamar Blvd., Austin, Executive Secy.
American Medical Association, Clinical Meeting, New York, June 3-7, 1957. Dr. Dwight H. Murray, Napa, Calif., Pres.; Dr. George F. Lull, 535 North Dearborn, Chicago 10, Secy.

Current Meetings

JANUARY

Texas Radiological Society, Corpus Christi, Jan. 18-19, 1957. Dr. J. R. Riley, Corpus Christi, Pres.; Dr. J. E. Miller, 6407 Forest Lane, Dallas, Secy.
Texas Society of Pathologists, Galveston, Jan. 26-27, 1957. Dr. Sidney W. Bohls, Austin, Pres.; Dr. M. H. Grossman, St. Paul Hospital, Dallas, Secy.

Twelfth District Society, Cleburne, Jan. 8, 1957. Dr. R. Henry Harrison, Bryan, Pres.; Dr. W. M. Avent, 1716 Colcord, Waco, Secy.

International Medical Assembly of Southwest Texas, San Antonio, Jan. 28-30, 1957. Dr. John C. Parsons, 1125 Nix Professional Bldg., San Antonio, Secy.

FEBRUARY

American Academy of Allergy, Los Angeles, Feb. 4-6, 1957. Dr. Carl E. Arbesman, Buffalo, N. Y., Pres.; Dr. Francis C. Lowell, 65 E. Newton, Boston, Secy.
American College of Radiology, Chicago, Feb. 8-9, 1957. Dr. Wilbur Bailey, Los Angeles, Pres.; Mr. W. C. Stronach, 20 N. Wacker Dr., Chicago 6, Executive Secy.
American College of Surgeons, New Orleans, Feb. 4-7, 1957. Dr. Daniel C. Elkin, Lancaster, Ky., Pres.; Dr. Michael L. Mason, 40 E. Erie, Chicago 11, Secy.

Texas Association of Obstetricians and Gynecologists, San Antonio, Feb. 23, 1957. Dr. Carey Hiett, Fort Worth, Pres.; Dr. Oran V. Prejean, 4317 Oak Lawn, Dallas, Secy.
Texas Proctologic Society, Houston, February, 1957. Dr. Harry B. Burr, Houston, Pres.; Dr. C. P. Hardwicke, 920 E. 32nd, Austin, Secy.
Texas Public Health Association, Houston, Feb. 17-20, 1957. W. T. Ballard, Tyler, Pres.; Mr. H. E. Drumwright, City Health Department, Dallas. Executive Secy.
Texas Urological Society, Dallas, Feb. 3, 1957. Dr. Rex Carter, Austin, Pres.; Dr. J. D. Mitchell, Jr., 3707 Gaston Ave., Dallas, Secy.

First District Society, Pecos, Feb. 12, 1957. Dr. E. W. Schmidt, Pecos, Pres.; Dr. John Dunn, Pecos, Secy.

National and Regional

American Academy of Dermatology and Syphilology. Dr. George M. Lewis, N. Y., Pres.; Dr. James R. Webster, 55 E. Washington, Chicago 2, Secy.
American Academy of General Practice, St. Louis, March 25-28, 1957. Dr. J. S. De Tar, Milan, Mich., Pres.; Mr. Mac F. Cahal, Volker Blvd. at Brookside, Kansas City 12, Executive Secy.
American Academy of Obstetricians and Gynecologists, Los Angeles, April, 1958. Dr. R. Gordon Douglas, New York, Pres.; Dr. John C. Ullery, Ohio State University Hospital, Columbus, Secy.
American Academy of Ophthalmology and Otolaryngology, Chicago, Oct. 13-18, 1957. Dr. Earling W. Hansen, Minneapolis, Pres.; Dr. W. L. Benedict, 100 First Ave. Bldg., Rochester, Minn., Secy.
American Academy of Pediatrics, Chicago, Oct. 5-10, 1957. Dr. Edgar E. Martmer, Detroit, Pres.; Dr. E. H. Christopherson, 1801 Hinman Ave., Evanston, Ill., Secy.
American Association for Thoracic Surgery, Chicago, May 4-7, 1957. Dr. Cameron Haight, Ann Arbor, Mich., Pres.; Dr. Hiram T. Langston, 600 S. Kingshighway, St. Louis 10, Mo., Secy.
American Association of Genito-Urinary Surgeons, Hot Springs, Va., May 1-3, 1957. Dr. Archie L. Dean, New York, Pres.; Dr. John A. Taylor, 2 E. 54th St., New York 22, Secy.
American Association of Obstetricians and Gynecologists, Hot Springs, Va., Sept. 5-7, 1957. Dr. F. Bayard Carter, Durham, N. C., Pres.; Dr. E. Stewart Taylor, University of Colorado School of Medicine, 4200 E. 9th, Denver, Secy.
American Cancer Society, New York, Oct. 30-Nov. 1, 1957. Dr. D. A. Wood, San Francisco, Pres.; Mr. M. R. Runyon, 521 W. 57th, New York, Executive Vice-Pres.
American College of Allergists, Chicago, March 20-22, 1957. Dr. Ethan Allen Brown, Boston, Pres.; Dr. Giles A. Koelsche, Mayo Clinic, Rochester, Minn., Secy.
American College of Chest Physicians, New York, May 29-June 2, 1957. Dr. Herman J. Moersch, Rochester, Minn., Pres.; Mr. Murray Kornfeld, 112 E. Chestnut, Chicago 11, Executive Secy.
American College of Gastroenterology, Boston, Oct. 21-26, 1957. Dr. Arthur A. Kirchner, Los Angeles, Pres.; Mr. Daniel Weiss, 33 West 60th, New York 23, Executive Director.
American College of Physicians, Boston, April 8-12, 1957. Dr. Walter L. Palmer, Chicago, Pres.; Mr. E. R. Loveland, 4200 Pine, Philadelphia 4, Secy.
American Congress of Physical Medicine and Rehabilitation, Los Angeles, Sept. 8-13, 1957. Dr. A. B. C. Knudson, Washington, D. C., Pres.; Dr. Frances Baker, 1 Tilton Ave., San Mateo, Calif., Secy.
American Congress on Obstetrics and Gynecology. Dr. R. Gordon Douglas, 116 S. Michigan Ave., Chicago 3, Chm.
American Dermatological Association, Belleair, Fla., April 13-17, 1957. Dr. Carroll S. Wright, Philadelphia, Pres.; Dr. J. Lamar Callaway, Duke Hospital, Durham, N. C., Secy.
American Gastro-Enterological Association, Colorado Springs, May 17-18, 1957. Dr. Sam A. Wilkinson, Jr., Boston, Pres.; Dr. H. Marvin Pollard, University Hospital, Ann Arbor, Mich., Secy.
American Gynecological Society, Hot Springs, Va., May 27-29, 1957. Dr. Norman F. Miller, Ann Arbor, Mich., Pres.; Dr. A. A. Marchetti, 3800 Reservoir Rd., N.W., Washington 7, D. C., Secy.
American Heart Association. Dr. Irvine H. Page, Cleveland, Pres.; Mr. Irving B. Hexter, 44 E. 23rd, New York 10, Secy.
American Hospital Association, Atlantic City, Sept. 30-Oct. 3, 1957. Dr. Albert W. Snoke, New Haven, Conn., Pres.; Dr. Edwin L. Crosby, 18 E. Division, Chicago, Executive Director.
American Laryngological, Rhinological, and Otological Society, San Francisco, Calif., 1958. No 1957 meeting. Dr. Percy E. Ireland, Toronto, Ont., Canada, Pres.; Dr. C. S. Nash, 277 Alexander, Rochester 7, N. Y., Secy.
American Neurological Association, Atlantic City, June 17-19, 1957. Dr. H. Houston Merritt, New York 32, Pres.; Dr. Charles Rupp, 133 S. 36th, Philadelphia 4, Secy.
American Ophthalmological Society, Hot Springs, Va., May 30-June 1, 1957. Dr. Frederick C. Cordes, San Francisco, Pres.; Dr. M. C. Wheeler, 30 W. 59th, New York 19, Secy.
American Orthopedic Association, Hot Springs, Va., June 24-27. Dr. David M. Bosworth, New York, Pres.; Dr. Harold A. Safield, 715 Lake St., Oak Park, Ill.
American Pediatric Society, Carmel, Calif., June 17-19, 1957. Dr. Daniel C. Darrow, Mission, Kan., Pres.; Dr. A. C. McGuinness, 1427 I St., N.W., Washington 5, D. C., Secy.

American Proctologic Society, New Orleans, April 24-27. Dr. Rufus C. Alley, Lexington, Ky., Pres.; Dr. Karl Zimmerman, 3500 Fifth Ave., Pittsburgh 13, Secy.

American Psychiatric Association, Chicago, May 13-17, 1957. Dr. Francis J. Braceland, Hartford 2, Conn., Pres.; Dr. William Malamud, 80 E. Concord, Boston 18, Secy.

American Public Health Association, Cleveland, Nov. 11-15, 1957. Dr. John W. Knutson, Washington, D. C., Pres.; Dr. R. M. Atwater, 1789 Broadway, New York 19, Executive Secy.

American Society of Anesthesiologists, Los Angeles, Oct. 14-18, 1957. Dr. Irving M. Pallin, Brooklyn, Pres.; Dr. J. E. Remlinger, Jr., 188 W. Randolph, Chicago 1, Secy.

American Society of Clinical Pathologists, Sept. 29-Oct. 4, 1957. Dr. J. L. Goforth, Dallas, Pres.; Dr. Clyde G. Culbertson, 1040-1232 W. Michigan, Indianapolis 7, Secy.

American Surgical Association, Chicago, May 8-10, 1957. Dr. Loyal Davis, Chicago, Pres.; Dr. R. Kennedy Gilchrist, 59 East Madison, Chicago 3, Secy.

American Urological Association, Pittsburgh, May 6-9, 1957. Dr. George C. Prather, Brookline, Mass., Pres.; Dr. Samuel L. Raines, 188 S. Bellevue Blvd., Memphis, Tenn., Secy.

Association of American Physicians and Surgeons, Delegates and Assembly, Miami Beach, Fla., April 25-27, 1957. Dr. Charles W. Pavey, Columbus, Ohio, Pres.; Mr. Harry E. Northam, 185 N. Wabash Ave., Chicago 1, Executive Secy.

International College of Surgeons, U. S. Chapter, Chicago, Sept. 9-12, 1957. Dr. Curtice Rosser, Dallas, Pres.; Dr. Karl Meyer, 1516 Lake Shore Dr., Chicago, Secy.

National Tuberculosis Association, Kansas City, May 5-10, 1957. Dr. Howard W. Bosworth, Los Angeles, Pres.; Mrs. Morrell DeReign, 1790 Broadway, New York 19, Secy.

Radiological Society of North America, Chicago, Nov. 17-22, 1957. Dr. C. Edgar Virden, Kansas City, Pres.; Dr. Donald S. Childs, 713 E. Genesee, Syracuse 2, N. Y., Secy.

South Central Association of Blood Banks, New Orleans, 1957. Dr. C. D. Fitzwilliams, Fort Worth, Pres.; Miss Marjorie Saunders, 3707 Gaston Ave., Dallas, Secy.

Southern Medical Association, Miami Beach, Nov. 11-14, 1957. Dr. J. P. Culpepper, Jr., Hattiesburg, Miss., Pres.; Mr. V. O. Foster, 1020 Empire Bldg., Birmingham 3, Secy.

Southern Psychiatric Association, Nassau, Oct. 6-8, 1957. William H. McCullagh, Jacksonville, Fla., Pres.; Dr. Joseph L. Knapp, 210 N. Westmoreland, Dallas, Secy.

Southern Surgical Association, White Sulphur Springs, West Va., Dec. 10-12, 1957. Dr. Floyd W. McRae, Atlanta, Pres.; Dr. George G. Finney, 2947 St. Paul, Baltimore, Secy.

Southwest Allergy Forum, Fort Worth, May 5-7, 1957. Dr. Truman C. Terrell, Fort Worth, Pres.; Dr. Sim Hulsey, 701 Fifth Ave., Fort Worth, Secy.

Southwest Regiinal Cancer Conference, Fort Worth, Fall, 1957. Dr. O. L. Morphis, 815 Medical Arts Building, Fort Worth, Chm.

Southwestern Medical Association, El Paso, Oct. 8-11, 1957. Dr. Celso Stapp, El Paso, Pres.; Dr. Russell L. Deter, 1501 Arizona St., El Paso, Secy.

Southwestern Society of Nuclear Medicine, Houston, April, 1957. Dr. Henry H. Turner, Oklahoma City, Pres.; Dr. J. R. Maxfield, Jr., 311 Medical Arts Bldg., Dallas, Secy.

Southwestern Surgical Congress, Wichita, Kan., April 15-17, 1957. Dr. John V. Goode, Dallas, Pres.; Dr. C. M. O'Leary, 207 Plaza Court Bldg., Oklahoma City, Secy.

Tri-State Medical Assembly, Shreveport, September, 1957. Dr. H. O. Padgett, Marshall, Pres.; Dr. Jason Sanders, Sanders Clinic, Kings Highway, Shreveport, La., Secy.

State

Private Clinics and Hospitals Association of Texas. Dr. J. P. Anderson, Brady, Pres.; Mr. C. H. Rugeley, Wharton, Secy.

Texas Academy of General Practice, Dallas, Sept. 22-25, 1957. Dr. George V. Launey, Jr., Dallas, Pres.; Mr. Donald C. Jackson, 308 W. 15th, Austin, Executive Secy.

Texas Academy of Internal Medicine, Houston, December, 1957. Dr. Jay C. Crager, Beaumont, Pres.; Dr. Hugo Engelhardt, 1216 Main, Houston, Secy. Meetings restricted to members.

Texas Air-Medics Association, Dallas, April 28-29, 1957. Dr. W. A. Ostendorf, Fort Worth, Pres.; Dr. C. F. Miller, P. O. Box 1338, Waco, Secy.

Texas Chapter, American College of Chest Physicians, Dallas, April 28, 1957. Dr. Walter C. Brown, Corpus Christi, Pres.; Dr. L. M. Shefts, 510 Moore Bldg., San Antonio, Secy.

Texas Chapter, American Association of Public Health Physicians, Dallas, April 28, 1957. Dr. W. V. Bradshaw, Jr., Fort Worth, Pres.; Dr. A. R. Doane, 410 E. 5th, Austin, Secy.

Texas Club of Internists. Dr. Hatch Cummings, Houston, Pres.; Dr. L. C. Carter, 2600 Procter, Port Arthur, Secy.

Texas Dermatological Society, Dallas, April 28-29, 1957. Dr. Thomas L. Shields, Fort Worth, Pres.; Dr. E. N. Walsh, 1310 Medical Arts Bldg., Fort Worth, Secy.

Texas Diabetes Association, Dallas, April 28, 1957. Dr. Edwin L. Rippy, Pres.; Dr. Richard E. Nitschke, 1702 Nix Professional Bldg., San Antonio, Secy.

Texas Division, American Cancer Society, Austin, Dec. 5-6, 1957. Dr. Porter Brown, Fort Worth, Pres.; Mr. Curt W. Reimann, 1609 Colorado, Austin, Executive Director.

Texas Geriatrics Society, Dallas, April 30, 1957. Dr. Wendell D. Gingrich, Galveston, Pres.; Dr. J. O. S. Holt, Jr., 3707 Gaston Ave., Dallas, Secy.

Texas Heart Association, Dallas, April 28, 1957. Dr. D. D. Warren, Waco, Pres.; Mr. Edgar M. Brown, 404 Jesse H. Jones Library Bldg., Texas Medical Center, Houston 25, Executive Director.

Texas Hospital Association, Houston, May 14-16, 1957. Mr. H. M. Cardwell, Lufkin, Pres.; Mr. O. Ray Hurst, Executive Director, 2208 Main, Dallas, Secy.

Texas Industrial Medical Association, Dallas, April 30, 1957. Dr. V. C. Baird, Houston, Pres.; Dr. Robert A. Wise, Box 2180, Houston, Secy.

Texas Neuropsychiatric Association, Dallas, April 28, 1957. Dr. John L. Otto, Galveston, Pres.; Dr. Clarence S. Hoekstra, 8215 Westchester Drive, Dallas, Secy.

Texas Ophthalmological Association, Dallas, April 30, 1957. Dr. Thomas J. Vanzant, Houston, Pres.; Dr. Louis Daily, Medical Arts Bldg., Dallas, Secy.

Texas Orthopedic Association, Dallas, April 29, 1957. Dr. John J. Hinchey, San Antonio, Pres.; Dr. Margaret Watkins, 3629 Fairmount, Dallas, Secy.

Texas Pediatric Society, Austin, Oct., 1957. Dr. E. M. Wier, Fort Worth, Pres.; Dr. James N. Walker, 5216 W. Freeway, Fort Worth, Secy.

Texas Rheumatism Association, Houston, December, 1957. Dr. Jesse W. Hofer, Houston, Pres.; Dr. Warren W. Moorman, 901 W. Leuda, Fort Worth, Secy.

Texas Society for Mental Health, Dallas, March 7-9, 1957. Dr. Carmen Miller, Dallas, Pres.; Mr. John Lane, 2510 San Antonio, Austin, Executive Director.

Texas Society of Anesthesiologists, Dallas, April 28, 1957. Dr. Charles R. Allen, Galveston, Pres.; Dr. Randle J. Brady, 3317 Binz, Houston, Secy.

Texas Society of Gastroenterologists and Proctologists, Dallas, April 28, 1957. Dr. John McGivney, Galveston, Pres.; Dr. O. P. Griffin, 1101 Medical Arts Bldg., Fort Worth, Secy.

Texas Society of Ophthalmology and Otolaryngology, Dallas, Dec. 6-7, 1957. Dr. Owen R. O'Neill, Paris, Pres.

Texas Society of Plastic Surgeons, April 27, 1957. Dr. Thomas D. Cronin, Houston, Pres.; Dr. Steve R. Lewis, University of Texas Medical Branch, Galveston, Secy.

Texas Surgical Society, Dallas, April 1-2, 1957. Dr. Truman G. Blocker, Galveston, Pres.; Dr. G. V. Brindley, Jr., Scott and White Clinic, Temple, Secy.

Texas Traumatic Surgical Society, Dallas, April 28, 1957. Dr. Russell Holt, El Paso, Acting Pres.;Dr. W. D. Marrs, 306 Broadway, Fort Worth, Secy.

Texas Tuberculosis Association, Fort Worth, April 4-6, 1957. Dr. Howard T. Barkley, Houston, Pres.; Mrs. J. V. Cooper, Waxahachie, Secy.

United States-Mexico Border Public Health Association, San Antonio, April 9-12, 1957. Dr. Guillermo Soberanes, Hermosillo, Sonora, Mexico, Pres.; Dr. Sidney B. Clark, 243 U. S. Court House, El Paso, Secy.

District

Second District Society, Big Spring, 1957. Dr. Clyde Thomas, Jr., Big Spring, Pres.; Dr. Nell W. Sanders, P. O. Box 191, Big Spring, Secy.

Third District Society, Lubbock, March 30, 1957. Dr. A. G. Barsh, Lubbock, Pres.; Dr. William Klingensmith, 708 Monroe St., Amarillo, Secy.

Fourth District Society. Dr. Joe B. Stephens, Bangs, Pres.; Dr. S. H. Martin, 115 S. Park, San Angelo, Secy.

Fifth and Sixth Districts Society. Dr. James C. Sharp, Corpus Christi, Pres.; Dr. Winston E. Riley, 2400 Morgan, Corpus Christi, Secy.

Seventh District Society, Austin, March, 1957. Dr. Leslie C. Colwell, Austin, Pres.; Dr. Robert N. Snider, 2410 Rio Grande, Austin, Secy.

Eighth District Society. Dr. E. Peter Garber, Galveston, Pres.; Dr. John Childers, Univ. of Texas Medical Branch, Galveston, Secy.

Ninth District Society, Navasota, April 3, 1957. Dr. C. Marius Hansen, Navasota, Pres.; Dr. Lyman C. Blair, 1212 Rothwell, Houston, 2, Secy.

Tenth District Society. Dr. Taylor Walker, Beaumont, Pres.; Dr. Alan E. Hubner, 590 Center, Beaumont, Secy.

Eleventh District Society, Jacksonville, Spring, 1957. Dr. M. T. Braswell, Henderson, Pres.; Dr. Hugh F. Rives, Jacksonville, Secy.

Thirteenth District Society. Dr. R. L. Nelson, Wichita Falls, Pres.; Dr. R. D. Moreton, 1217 W. Cannon, Fort Worth, Secy.

Fifteenth District Society, Mount Pleasant, April, 1957. Dr. L. E. Rutledge, Daingerfield, Pres.; Dr. O. R. Taylor, Jr., Linden, Secy.

Clinics

Blackford Memorial Cancer Lectures, Denison, Fall, 1957. Dr. John D. Gleckler, 211 N. Fannin, Denison, Chm.

Dallas Southern Clinical Society, March 18-20, 1957. Dr. Howard C. Coggeshall, Dallas, Pres.; Miss Helga Boyd, Medical Arts Bldg., Dallas 1, Executive Secy.

New Orleans Graduate Medical Assembly, March 11-14, 1957. Dr. Eugene H. Countiss, New Orleans, Pres.; Dr. Maurice E. St. Martin, 626 Maison Blanche Bldg., New Orleans 16, Secy.

North Texas-Southern Oklahoma Fall Clinical Conference, Wichita Falls, Oct. 19, 1957. Dr. Kenneth C. Bebb, 1518 10th, Wichita Falls, Chm.

Oklahoma City Clinical Society Conference, Oklahoma City, Oct. 28-30, 1957. Dr. Herman Fagin, Oklahoma City, Pres.; Miss Alma F. O'Donnell, 503 Medical Arts Bldg., Oklahoma City 2, Executive Secy.

Postgraduate Medical Assembly of South Texas, Houston, July, 1957. Dr. C. Forrest Jorns, 5644 Lawndale, Houston, Secy.

State Tumor Conference, Wichita Falls, April 3, 1957. Mrs. Chester Robinsin, Wichita County Medical Society Tumor Clinic, Wichita Falls, Secy.

Board Examinations

Texas State Board of Examiners in Basic Sciences, next examination, April and October, 1957. Henry B. Hardt, Ph.D., Fort Worth, Pres.; Mrs. Pearl A. Barrera, 407 Perry-Brooks Bldg., Austin, Chief Clerk.

Texas State Board of Medical Examiners, Fort Worth. Dr. M. H. Crabb, 1714 Medical Arts Bldg., Fort Worth, Secy.

MEDICOLEGAL NOTES

Nontherapeutic Sterilization: Civil Liability

The question of possible civil liability in regard to nontherapeutic sterilization procedures will be dealt with in this last article relating to the various legal aspects of sterilization.

Again it must be stated that this is an area in which there has been little litigation, and as a result the decision a court in this state might reach, should the matter be brought before it, is not definite. This in itself is a real danger. The mere unpredictability of the result should direct a course of utmost caution in acting in this area of the law. Should our courts be called upon to decide this issue of nontherapeutic sterilization, they would use the cases in other states dealing with this matter as well as the reasoning applied in similar or comparative areas of the law to guide them. It is with this in mind that the following discussion is presented.

In the last issue of the *Journal* (p. 879) was discussed the possible criminal liability resulting from nontherapeutic sterilization procedures. From this area of possible criminal violation arises a corresponding possibility of civil liability. If a physician is held to be in violation of a criminal law, such as Article 1166 dealing with mayhem or maiming, then this, in turn, would give rise to what is known as "negligence per se." Negligence per se might be described better by saying it is negligence in itself or negligence as a matter of law. As an example:

John and Jean are husband and wife. John decides that he wishes to be sterilized, and such desire is not because of medical necessity. The procedure is performed. Later Jean discovers this fact, and because she had wanted more children and because this desire has been denied by the sterilization, she sues the physician. She is able to show that the procedure was in violation of a criminal statute (Art. 1166). As a result of being able to show this violation, she has established negligence per se on the part of the doctor. All that would be necessary from this point on would be to show damages, and the fact that she would be unable to have the additional children she desired most likely would give the jury all the evidence it would need to hold that she had been damaged.

Taking this same example, assume that John has the sterilization procedure performed. Subsequently, Jean dies and John remarries but does not disclose the fact of the sterilization to his second wife. After being unable to have children, the second wife discovers that John is sterile due to the sterilization procedure which had been performed previously. At this point, the second wife may well have two avenues of approach. She may apply to the court for an annulment or divorce because of a fraud being perpetrated upon her, or she may elect to sue the physician who performed the procedure. She might well base her suit in the latter case upon the fact that she was denied the right to have children, not through any fault of her own doing, but because of an act on the part of John and the physician. This might be sufficient to hold the physician liable for damages without even showing the violation of a criminal statute as was mentioned earlier.

The last example brings up another situation mentioned in previous articles, that dealing with consent. As noted before, I believe that it is of utmost importance to obtain the consent of *both* spouses in any procedure which will or might result in sterilization. Although there is authority to support the reasoning that each person has an inherent right to decide what is to be done to his or her own body, I believe that in procedures dealing with *therapeutic* sterilization, it is advisable to gain the consent of both spouses because this procedure definitely will have a direct effect on the other spouse, namely, the ability to have children. The question then posed is, What effect does consent by one spouse or both spouses have upon possible civil liability for *nontherapeutic* sterilization?

In the preceding two examples we saw that the consent of one spouse would not necessarily offer any protection to the operating physician because the wrong which had been done was not done to the consenting spouse but to the spouse who had not consented or who was unaware of the condition, such wrong being denial of the right to have children.

Let us now take two like situations in which (1) both spouses have consented to this procedure being performed and (2) John, either single or married, is the sole party to consent but after the procedure regrets his decision. Both parties sue the physician performing these procedures. Even though these facts are different, the results reached likely would be the same. Should either of these situations come to trial, the attorney for the physician undoubtedly would use the doctrine of "pari delicto" (a party to the crime cannot take advantage of his wrong) in defending this action or possibly the doctrine of "volenti non fit injuria" (he who consents is not damaged). These doctrines, though seemingly a good defense to an action based on the two examples, might well prove of no avail. This easily could result from the courts holding that "public policy" was involved as a result neither of these doctrines of law would apply, and any consent given, whether written or oral, would be of no avail. In view of some of the ideas which have been expressed on this subject of sterilization, the court might hold that because the interest of society and the welfare of our state is involved, this is an issue which must be resolved without some of the defenses that might ordinarily be available. The courts often have held that where public policy or interest is involved, the good of the public must control even though certain individuals apparently may suffer. If this reasoning should be applied by the courts, even though an individual may have consented to a

nontherapeutic sterilization procedure, liability on the part of the physician easily could result.

As is evidenced by some of these examples, there are some grave dangers and problems in regard to nontherapeutic sterilization, and ones which easily could result in civil liability on the part of the physician performing such a procedure. Even though there has been little litigation in this area, there is no assurance that this lack of action will continue. With this possibility in mind, it is my opinion that from a legal standpoint any sterilization procedure which is performed which does not find its justification based upon therapeutic reasons is exceedingly dangerous.

—PHILIP R. OVERTON, LL.B., Austin.

Law-Science Course to Include Doctors

"Medicolegal Aspects of the Face, Head, and Neck" will be the subject of the midwinter law-science short course to be offered by the University of Texas Law-Science Institute in Austin, February 7-9. Designed primarily for trial lawyers, the course also will be open to physicians, Dr. Hubert W. Smith, director, has announced, and trial sequences in which attorneys will examine and cross examine medical specialists will be included.

Among the doctors who will assist in instruction are Drs. Francis A. Echlin, New York University, New York; E. S. Gurdjian, Wayne University, Detroit; and Howard P. Rome, Mayo Clinic, Rochester, Minn. Others include Drs. Truman G. Blocker and Stephen R. Lewis, Galveston, maxillofacial injuries; Drs. R. N. Cooley, Galveston; John E. Skogland, Houston; and Louis M. Hefer, San Antonio, and C. M. Pomerat, Ph.D., Galveston, head injuries; and Drs. Hanes H. Brindley, Temple, and Ruth Jackson, Dallas, neck injuries. Eleven lawyers from Alabama, Florida, Illinois, Minnesota, New York, Oklahoma, and Texas will participate.

Fee for the course is $50, plus $5 for a banquet and certificate showing completion of the course; fee for a single day is $20.

Hoxsey Treatments Declared Worthless

For the second time, a federal court has determined that the Hoxsey medicines for internal cancer are worthless. A news release from the Food and Drug Administration of the Department of Health, Education, and Welfare reports that a jury in Pittsburgh, Pa., returned a verdict November 15 that these medicines, in pill form, were illegally offered as an effective treatment for cancer, and the court ordered their destruction.

This action, however, does not end the Hoxsey clinics nor their treatments, the release said. An injunction is being sought to stop further interstate shipment of the pills. Harry M. Hoxsey has continued to promote his cure for more than 30 years, notwithstanding numerous local and state court actions.

Legislative Proposals

The broad outline of legislative proposals to come from the administration in the newly convened eighty-fifth Congress has been outlined by the Department of Health, Education, and Welfare Secretary Marion B. Folsom in several news conferences. Among the proposals are federal grants to medical schools for teaching facilities, authorization for smaller insurance companies to pool resources without violating the antitrust laws in an effort to encourage expansion of voluntary health insurance, increased attention to problems of older persons, continued expansion and improvement in vocational rehabilitation, and expansion of staff and facilities of the Food and Drug Administration.

TEXAS AND TEXANS

Dallas Southern Clinical Society

General assemblies, round-table luncheons, postgraduate lectures, panel discussions, a clinicopathologic conference, and exhibits will be featured during the twenty-sixth annual conference of the Dallas Southern Clinical Society March 18-20.

Postgraduate lectures will be given on common skin diseases, the hemangiomas, care of chest injuries, intracranial lesions in the aged, breech presentation, the menopause, the diabetic in stress, migraine headache, how to lessen coronary heart disease, medical treatment of asthma, diseases of the eye, the common cold, hemorrhagic diseases, hypertension in everyday practice, pitfalls in general surgery, hernia repair, knee and ankle injuries, immunizations in pediatrics, peptic ulcers, present methods of treatment of tuberculosis, the stomach and duodenum, polyps of the large bowel, impotence in the male, and psychotherapy in general practice.

Guest speakers will be Drs. Carl E. Badgley, Ann Arbor, orthopedic surgery; Leo H. Bartemeier, Baltimore, psychiatry; John I. Brewer, Chicago, obstetrics and gynecology; Joe R. Brown, Rochester, neurology; W. Edward Chamberlain, Philadelphia, radiology; Amos Christie, Nashville, pediatrics; John J. Conley, New York, otolaryngology; Walter H. Fink, Minneapolis, ophthalmology; Tinsley R. Harrison, Birmingham, internal medicine; John C. Jones, Los Angeles, thoracic surgery; Robert A. Kimbrough, Philadelphia, obstetrics-gynecology; Wyland F. Leadbetter, Boston, urology; Peter N. Pastore, Richmond, otolaryngology; R. Townley Paton, New York, ophthalmology; Wesley W. Spink, Minneapolis, internal medicine; John D. Stewart, Buffalo, surgery; Shields Warren, Boston, pathology; and Claude E. Welch, Boston, surgery.

Details of registration, and requests for accommodations may be obtained from the Dallas Southern Clinical Society, Medical Arts Building, Dallas 1.

Personals

Dr. Michael E. DeBakey, Houston, was one of 10 American physicians and researchers honored by *Modern Medicine* this month for distinguished achievement. Winners of the annual awards, featured on the January 1 cover of the semimonthly journal, were nominated by deans of medical schools and readers of the periodical; final selection was by the board of editors. Dr. DeBakey was cited for "making aortic resection a safe procedure and his work on replacement of vascular defects with homografts and plastic bridges."

Dr. Neil D. Buie, Marlin, has served as chairman of a committee which adopted a code of standards for the medical supervision of health resorts. The committee worked under the auspices of the Association of American Spas.

Dr. Everett L. Goar, Houston, is a member of the board of trustees of the newly established National Medical Foun-

dation for Eye Care, a nonprofit scientific and educational institution.

Dr. Albert T. Hume, Temple, has been appointed manager of the veterans administration hospital at Outwood, Ky. He formerly was director of professional services at the Veterans Administration center in Temple.

Drs. George R. Herrmann, Milton R. Hejtmancik, Zang Z. Zao, J. R. Wright, and *Allen Shields,* all of Galveston, participated in the November program of the fifth Congreso Inter-Americano de Cardiologia held in Cuba. *Dr. Herrmann* was elected to the Council of Honor for meritorious scientific services.

Dr. E. J. McCranie, acting chairman of the Department of Psychiatry at Southwestern Medical School of the University of Texas, Dallas, since 1953, has been named professor of psychiatry at the Medical College of Georgia, Augusta.

Girls were born to *Dr. and Mrs. Irvin M. Cohen* October 27 in Galveston and *Dr. and Mrs. Robert Guy,* November 10 in Galveston; *Dr. and Mrs. Wray McCash* became parents of twin girls August 26 in Galveston.

New parents of boys are *Dr. and Mrs. James B. Harle,* November 15, in Bellville; *Dr. and Mrs. S. G. Thompson* November 10 in Galveston; and *Dr. and Mrs. Patrick H. Pappas,* September 3, in Galveston.

Patient Care Commission Elects

The Texas Commission on Patient Care at its latest meeting early in December in Dallas elected new officers. Sister Mary Vincent, administrator of St. Joseph's Hospital in Fort Worth was reelected chairman; Dr. Russell D. Holt of Meridian was elected vice-chairman; and Ted Bowen, administrator of the Methodist Hospital in Houston was reelected treasurer.

Mrs. Richard C. Bellamy of Liberty, President of the Woman's Auxiliary to the Texas Medical Association, and Dr. Joe A. Shepperd of Burnet, president-elect of the Private Clinics and Hospitals Association of Texas, were asked to attend future meetings of the commission or to send representatives so that they can bring their viewpoints on improving patient care.

A survey of nursing needs and resources in Texas is to be done by representatives from medicine, hospital administration, nursing, general education and the consumer public in association with the Commission. It is hoped by commission members that this survey will enable planning for the future of Texas health needs.

The commission has received its charter from the Secretary of State and is now a nonprofit corporation in Texas, directed by the appointed members representing the Texas Medical Association, Texas Hospital Association, Texas Graduate Nurses' Association, and Texas League for Nursing.

As an example of ingenious methods adopted for financially supporting the Texas Commission on Patient Care, the commission points to Brackenridge Hospital in Austin. As Brackenridge had no money in its budget to support the program of the commission, the staff sold tickets to a smorgasbord dinner. More than 400 tickets were sold to the meal, prepared and served in the hospital, and checks totaling $306.85 were turned over to the Texas Hospital Association for the commission.

Rumph Nominated to Head AAPS

Two Texans figured prominently in the October 19-20 delegates' interim meeting of the Association of American Physicians and Surgeons in Chicago. Dr. Mal Rumph, Fort Worth, was nominated for the office of president-elect. He is beginning his fifth year as director of the AAPS essay contest. Dr. E. E. Anthony, Jr., Fort Worth, presented a report of the membership committee, of which he is chairman.

University of Texas Medical Branch

Dr. Edgar Zwilling, director of developmental biology, National Research Foundation, and Dr. William P. Longmire, Jr., professor of surgery, University of California School of Medicine, were recent guests at the University of Texas Medical Branch, as were Dr. William W. Cort, Johns Hopkins University School of Hygiene and Public Health; Col. Victor Byrnes, office of the surgeon general, Washington; and Dr. Richard J. Bing, professor of medicine, Washington University School of Medicine.

Texas Association of Blood Banks

At a recent meeting of the Texas Association of Blood Banks, members voted to enlarge the scope of the association to include blood banks in the states of Louisiana, Arkansas, Oklahoma, New Mexico, and Mississippi, and to change the name of the organization to South Central Association of Blood Banks.

Dr. C. D. Fitzwilliam, Fort Worth, took office as president; other officers for the coming year are Dr. Louis Manhoff, Jr., San Antonio, president-elect; Dr. Jarrett E. Williams, Abilene, vice-president; Miss L. Jean Stubbins, M. T., Galveston, treasurer; and Miss Marjorie Saunders, LL.B., Dallas, secretary.

OUT OF STATE

Nurses Invited to ACS Meeting

Nurses have been invited to be the guests of the American College of Surgeons at a four day meeting in New Orleans February 4-7. An extensive special program has been arranged for them, and there will be hospital field trips. Nurses also will be welcome to attend all sessions prepared for surgeons and surgical specialists. The nurses' program will include panel discussions and symposiums on "The Health Team in Action in Surgery of the Lung," "Comprehensive Care of Patients with Burns," "Understanding the Aging Person and His Needs," "Working Together to Improve the Surgical Care of Geriatric Patients," "Behind the Scenes in Thoracic Surgery," "Immediate Postoperative Care," and "Problem Clinic on Recovery Rooms." There will be no registration fee.

MEXICO SITE OF SURGICAL MEETING

The International College of Surgeons has invited all physicians and medical personnel to attend its international congress in Mexico, D. F., February 24-28. All phases of surgery will be discussed by surgeons from throughout the world in a four day session at the University of Mexico; social events have been planned; and two postcongress tours have been arranged.

Registration for the congress and reservations for transportation and hotel accommodations are being handled by the International Travel Service, Inc., Palmer House, Chicago 3.

OF GENERAL INTEREST

Postgraduate Courses

Radioisotopic Therapy of Malignant Diseases, January 14-15, Dallas.—This course was offered through the Postgraduate Division, University of Texas Southwestern Medical School, and was made possible by a grant from the Texas Division, American Cancer Society.

Anesthesiology, January 23-25, Houston.—The mechanics of pulmonary ventilation, pharmacology and anesthetic drugs, premedication and preoperative preparation of the patient, and related circulatory problems will be stressed. Physicians, dentists, and nurse anesthetists may apply by writing the University of Texas Postgraduate School of Medicine, Texas Medical Center, Houston 25.

Rheumatic Diseases, Houston, February 27-March 1.—The University of Texas Postgraduate School of Medicine will offer this course, to cover present day concepts and management of rheumatic diseases, with Drs. Joseph Bunim, Bethesda, Md.; Richard Freyberg, New York; and William P. Holbrook, Tucson, Ariz., as guest lecturers, assisted by members of the Postgraduate School faculty. Tuition fee of $40 and application for admission should be mailed to the Postgraduate School, Texas Medical Center, Houston 25, before February 18.

Medicine and Surgery, March 4-6, Temple.—The Temple Division of the University of Texas Postgraduate School of Medicine will offer the fifth Scott, Sherwood, and Brindley Foundation Postgraduate Conference, and detailed information is available from the director of the foundation, Scott and White Clinic, Temple.

Mediclinics, March 4-14, Fort Lauderdale, Fla.—The Florida Academy of General Practice is the local sponsor of the course, which consists of 32 hours of lectures and panels conducted by a faculty of experts. Nearly all phases of medicine will be covered, and a complete list of the times and subjects for all courses is available by writing Mediclinics, 516 Medical Arts Building, Minneapolis 2. Registration will be limited to 300 in order to preserve an informal atmosphere in the lecture rooms. Tuition is $50.

Fractures, April 10-13, Chicago.—This three and one-half day course will be offered to all members of the medical profession by the Chicago Regional Committee on Trauma of the American College of Surgeons. Clinical cases will be presented, and discussions and questions from the audience will be invited. Complete details on this course may be obtained by writing Dr. John J. Fahey, 1791 West Howard, Chicago.

Crash Studies to Be Reviewed

A review of the Cornell University automotive crash injury studies, including those in Texas, will be held February 14, when John O. Moore, director of research, and Robert M. Tracy, field supervisor of the project, will meet in Austin with representatives of the Texas Medical Association, State Department of Health, Texas Department of Public Safety, and others interested in the program.

A group of key persons in the Texas program will have luncheon together, and then an open meeting will permit a larger audience to hear up-to-date information about the research. Mr. Moore will show a recently produced motion picture in which the American Medical Association and the Ford Motor Company collaborated to show something of the automotive crash research and the results in new safety devices on late model cars. He also will discuss speed and impact studies, and charts contained in a "Primer of Accident Facts," which will be released in the near future.

The Texas Safety Association is taking this opportunity to present safety awards to the Texas Medical Association, the Texas State Department of Health, and the Department of Public Safety for their part in the research program. For approximately a year, McLennan, Smith, and Travis County physicians, state police, and health officers collected data on accidents in their areas for statistical processing at Cornell University Medical College, New York, and last November 1 the study areas were moved to Lubbock, Nueces, and Wichita Counties.

March of Dimes

Every January since the National Foundation for Infantile Paralysis was established, the people of the United States have supported the battle against poliomyelitis through the organization's fund raising arm, the March of Dimes.

This support has resulted in Salk vaccine protection for many millions of children and treatment for hundreds of thousands of others who could not benefit from the vaccine, the foundation points out.

During 1956, nearly 16,000 persons were struck down by poliomyelitis; this was the lowest number recorded since 1947. Although the reductions due to the use of Salk vaccine were gratifying, poliomyelitis proved that it still packed a deadly punch.

Of the 44,000,000 persons who have received vaccine, only 7,000,000 have completed the full course of three inoculations. In September, it was estimated that enough vaccine was on hand or in production to supply the entire three-shot series for 97,000,000 persons.

During 1956, the National Foundation provided $23,000,000 for patient aid, $2,000,000 for respirator and rehabilitation centers, $3,300,000 for scientific research, and $2,800,000 for a professional education program.

The March of Dimes still has work to do—many children and adults need special treatment, and protective and therapeutic techniques must be improved. Contributions to the March of Dimes are tax deductible, and may be made to local chapters of the foundation.

MARKLE FUND

The Markle Foundation has announced that it will continue for the tenth year its program of five year grants for young medical school faculty members seeking careers in academic medicine. During the nine years of the program, a total of $5,320,000 has been appropriated toward the support of 181 doctors in 69 medical schools in the United States and Canada. The foundation was established in 1927 by John Markle, a Pennsylvania coal operator, and grants for scholars in medical science are now the major program of the fund.

Memorial Library Honors Benefactors In Milestone Ceremony

The Memorial Library of the Texas Medical Association is taking its place among the large medical libraries this month, when volumes number 25,000 and 25,001 are presented in a special ceremony. The event is being held in Austin Saturday afternoon, January 26, at which time the Board of Trustees will formally honor the benefactors in the growth and development of the Library.

But the Library staff is well aware that a large number of volumes alone does not make the Library valuable for the physicians of Texas. More than 600 medical journals from all over the world are currently being received, and more than 200 films are available for loan. In 1956 alone, the number of reprints, journals, and books circulated by the Library exceeded 18,000, and the number of films loaned that year passed 700. There was a record high reference request of 2,400 this past year, which represented greater than a 100 per cent increase since 1953, doctors in more than 200 counties in the state use the Library services.

Since the Texas Medical Association moved into its own building in Austin (September, 1952) with adequate facilities for a library, the Memorial Library has developed more than in its entire existence before. In the past four years, 15,000 volumes have been catalogued. Volumes in the Library stacks cover a period of almost 500 years of printing, with the earliest volume printed in 1528. Many complete series of journals may be found in the Library, including the *American Journal of Medical Sciences* from the first volume in 1828 to the present and the *Practitioner* from its beginning in 1869 to date.

The Library's growth cannot be attributed to any one person or group of persons. Credit is due to the many people, physicians and laymen alike, who have generously supported the Library.

Ceremony Honors Benefactors

Among those contributions of $1,000 or more to be recognized during the ceremony are:

Dr. and Mrs. Sam E. Thompson Memorial Fund, established by Dr. and Mrs. Sam E. Thompson of Kerrville in 1940.

Warner E. Williams Memorial Fund, established by Dr. and Mrs. E. W. Bertner of Houston in 1940, in memory of Mrs. Bertner's father.

Texas Pediatric Society Library Endowment Fund, established by the Texas Pediatric Society in 1940.

Hattie Preston Hunt Memorial Fund, established by Dr. Preston Hunt of Texarkana in 1941, in memory of Mrs. Hunt.

Dr. and Mrs. N. D. Buie Fund, established by Dr. and Mrs. N. D. Buie of Marlin in 1942.

Mr. and Mrs. William Thomas Carter Memorial Fund, established by Dr. and Mrs. Judson L. Taylor of Houston in 1943, in memory of Mrs. Taylor's parents.

Dr. Martin Junius Taylor Fund, established by Dr. and Mrs. Judson L. Taylor of Houston in 1943, in tribute to Dr. Taylor's brother.

Romayne Ray Memorial Fund, established by Mr. and Mrs. G. A. Ray of Pettus in 1944, in memory of their daughter.

Presidents' Library Endowment Fund, established by the Past Presidents and President of the Woman's Auxiliary to the Texas Medical Association in 1944.

Inez Anthony Hudgins Endowment Fund, established by Dr. D. H. Hudgins of Forney in 1945, in honor of his daughter.

County Medical Society Library Endowment Fund, established in 1945.

Dr. Stirling E. Russ Memorial Fund, established by Dr. and Mrs. W. B. Russ of San Antonio in 1946, in memory of their son.

Mary Carter Owens and Mattie Hanes Brindley Memorial Fund, established by Dr. and Mrs. G. V. Brindley in 1950, in memory of their mothers.

Dr. and Mrs. V. R. Hurst Fund, established by Dr. and Mrs. V. R. Hurst of Longview in 1951.

Dr. and Mrs. J. C. Terrell Fund, established by Dr. and Mrs. J. C. Terrell of Stephenville in 1951.

Woman's Auxiliary Endowment Fund, established by the Woman's Auxiliary to the Texas Medical Association in 1951.

G. A. Ray Memorial Fund, established by Dorothy Ray Lewis, sister of Mrs. S. F. Harrington of Dallas, in 1953, in memory of their father.

Dr. S. N. Key, Sr. Memorial Fund, established by the Ophthalmic Research Foundation of Austin in 1956.

Dr. Milford O. Rouse of Dallas, President of the Texas Medical Association will preside over the special ceremony honoring the Library's benefactors. The contributors of

Title pages of two rare books to be presented to the Memorial Library of the Texas Medical Association at special ceremonies in Austin on January 26. A first edition of William Beaumont's "Experiments and Observations on the Gastric Juice, and the Physiology of Digestion," 1833, is at the left; "De Re Medicus" of Cornelius Celsus, 1528-1529, is at the right.

the large gifts previously mentioned will be introduced by Dr. R. W. Kimbro of Cleburne, chairman of the Association's Board of Trustees. Mrs. Richard C. Bellamy of Liberty, President of the Woman's Auxiliary to the Texas Medical Association, will present the two rare books—volume number 25,000, "De Re Medicus" of Cornelius Celsus,

dated 1528 and 1529, in honor of the late Dr. Sam E. Thompson of Kerrville, who was a President of the Association and a chairman of the Board of Trustees; and volume number 25,001, "Experiments and Observations on the Gastric Juice, and the Physiology of Digestion" by William Beaumont, dated 1833, in memory of the late Dr. Sam N. Key, Sr., who was a member of the Board of Trustees of the Association and chairman of its building committee. Reviews of these two books are published in the December issue of the *Journal*.

Development of Library

Although the Memorial Library has grown rapidly during the past four years to reach its present status, its story prior to that time is indeed different. In fact, once the Association's library was given to the Fort Worth Medical College, which later merged with Baylor University College of Medicine. In the early 1920's the Association again started to build a library. The Board of Trustees appropriated $500 in 1924-1925 for the library, not even half of which ($168.23) was reported by the auditors in 1926 as having been used for library expenditures. The following year Dr. R. B. Anderson was employed as assistant secretary of the Association, and from then on the library began developing more steadily, along the lines of the American Medical Association Library in Chicago, where he spent several days studying its organization and operation.

The Texas Memorial Medical Library Association was formed on May 13, 1940, to exist for a period of 50 years to accept tax-free gifts for the support of the Library. Membership in the association was limited to the members of the Board of Trustees of Texas Medical Association. That year three endowment funds of $1,000 each were established, and since that time more than a dozen other endowments of $1,000 have been given to the Library.

After the death of Dr. Anderson in 1947, Dr. Holman Taylor, who had been secretary of the Association for many years and had had an interest in a library throughout his administration, became librarian. Dr. Taylor served as librarian until his death less than a year later, at which time Mrs. Estelle Parnell was promoted to librarian, a position which she held for two years. Then Mrs. Katheryn Wendler, assistant librarian, was in charge of the Library until 1952, when the first trained medical librarian, Miss Pauline Duffield, joined the staff. The Library since that time has consisted of four full-time employees and one part-time employee.

The Library staff answers promptly—usually the same day—requests for material on any medical subject from doctors throughout the state; and books, reprints, and journals are loaned free of charge, as are motion picture films, which are designed for both medical and lay audiences. It is hoped the Library's Rare Books Room eventually will become a shrine for those interested in medical history, and a growing collection of rare books and medical memorabilia which have been donated to the Library may be found there now. Any member of the Association is welcome to visit the Library and brouse through its stacks, and all physicians are urged by the staff to avail themselves of the Library's services.

The importance of a library for the physicians of the state was recognized by the authors of the Association's first constitution in 1853, for one of the purposes found in Article I is "to extend medical knowledge and advance medical science." The greatest impetus for the development of the Memorial Library to help fulfill this purpose was furnished by Dr. Sam E. Thompson, who gave encouragement and financial support during his lifetime and left $50,000 in his will for Library accessions. Another physician greatly responsible for the fulfillment of this purpose was Dr. Sam N. Key, Sr., who gained the concept of the necessity for a trained medical librarian and who carried a major portion of the responsibility during the construction and furnishing of the Association's headquarters and Library building.

An official group of physicians also played an important part in the development of the Library, for these men worked "to secure donations and endowment funds for the Texas Memorial Medical Library Association, and to keep the membership of the Association acquainted with the services offered by the Library to members and the public, and its needs for continuous greater development and greater services." This group was the Association's Committee on Library Endowment.

Under the presidency of Dr. L. H. Reeves of Fort Worth, the first library committee was appointed in 1940 for the solicitation of funds for the support of a medical library, and Dr. Sam E. Thompson was named chairman. In 1943 with Dr. Reeves as chairman, the Committee wrote each county medical society in the state setting forth the valuable services being rendered by the Library to the doctors of Texas and the great need for endowment funds. As a result of this drive and the continued efforts of the committee under the chairmanship of Dr. B. E. Pickett, Sr. of Carrizo Springs, the County Medical Society Library Endowment Fund was established in 1945, with donations totaling $1,543.

The Committee on Library Endowment functioned as a standing committee of the Association from 1946 to 1956, when it requested its dissolution because it felt its job had been done. Nevertheless, the committee believed that physicians increasingly would find the services of their Library invaluable and should recognize the continuing need for supporting it with further endowment funds.

Gifts to the Library

Dr. L. G. Burton, Woodville, 128 unbound journals; 5 bound journals.

Dr. Harry T. Davidson, Austin, 29 journals.

Dr. J. E. Johnson, Austin, 10 books; 15 reprints; 16 journals.

Dr. S. N. Key, Jr., Austin, 1 book; 17 journals.

Mrs. George S. Littell, Dallas, 6 books.

Dr. Dean Nichols, Temple, 189 journals; 1 book.

Dr. H. O. Padgett, Marshall, 28 journals.

Dr. A. D. Pattillo, Austin, 19 journals.

Dr. Jerome O. Ravel, Austin, 17 books; 40 journals.

Dr. Harold L. Robinson, Austin, 15 bound journals; 55 unbound journals; 1 book.

Dr. B. O. White, Austin, 39 journals.

★ Motion Pictures

The Case of the Doubting Doctor

16 mm., sound, color, 30 min., 1956.

A newspaper editor, golfing with three local physicians, discovers an interesting story while listening to a debate on the merits of the American Medical Association and medical societies. The "doubting" doctor, prompted by a bet, sets out to prove his criticisms. Instead, he finds himself taking his first good look at AMA activities which benefit both the physician and the public. Emphasis is placed not only upon AMA's activities, but also upon the activities of the state and county medical societies.

Unconditional Surrender

Sound, black and white, 14 min., 16 mm.

Laboratory scenes of the complete manufacturing process and testing of the Salk vaccine are shown. This film has been cleared for television.

On Impact

Sound, black and white, 16 mm.

Filmed for the American Medical Association and the Ford Motor Company, this documentary film shows how the medical profession and the automobile industry are cooperating to work out the new approach to highway safety. It contains a report from the Automobile Crash Research Project at Cornell University Medical College on the effectiveness of five new automobile safety devices which were introduced for the first time in 1955.

★ Books

Should the Patient Know the Truth

SAMUEL STANDARD, M. D., *and* HELMUTH NATHAN, M. D., Eds. *159 pages. $3. New York, Springer Publishing Company, Inc., 1955.*

Twenty-three prominent persons in the fields of medicine, nursing, law, and religion present their opinions concerning whether or not a patient with an incurable disease should be told the exact nature of his condition. As might be expected, the opinions are as varied as the professions. There could, of course, be no pat answer to such a question, though some of the authors have very positive feelings about the matter.

Dr. Owen Wangensteen, for example, writes that the surgeon should refrain from deceiving the cancer patient. He feels that in most cases, sooner or later, the victim learns the truth and resents the fact that he has been deceived by his doctor. Dr. Wangensteen also advocates the "second look" for patients who have had cancer surgery. The "second look" is an additional operation following the primary procedure by several months, the purpose being to seek out metastasis which might not have been resected in the first procedure. He brings this in to support his idea that advances are being made constantly in the fight against malignancy and that the patient with cancer should have hope until death that something might be found which will benefit him.

John A. Goodwine, a distinguished Catholic, feels also that the patient who is Catholic must be told that he is about to die, so that he may prepare himself for passing into eternity. He then is given an opportunity to mold and solidify his friendship with God by receiving the Last Sacrament of his church.

Rabbi Louis I. Newman quotes the Midrash (The Holy Law of Jewish tradition):

> "Even when the physician sees that death is approaching, he still says to the patient: "Eat this and abstain from that; drink this and not that"; but he does not say "Your end is near," and he rebukes the prophet Isaiah in the name of the King Hezekiah for telling him bluntly, "Set thy house in order for thou shalt die and not live." (II Kings 20:1.)

Dr. Paul D. White encourages optimism when discussing a patient's condition. He feels that we should concentrate strongly on the beneficial things that can be done for a patient in relieving his symptoms. Hope for a cure should be illuminated, for optimism itself is a valuable tool if it can be instilled in the desperately ill.

—W. B. Neely, M. D., Bellville.

Histamine; Its Role in Anaphylaxis and Allergy

M. ROCHA E. SILVA, M.D., *Department of Biochemistry and Pharmacodynamics, Instituto Biologico, Sao Paulo, Brazil. 248 pages. $7.50. Springfield, Ill., Charles C Thomas, 1955.*

This monograph covers the subject of histamine very thoroughly. Synthesis, isolation, chemical and physical properties, pharmacology, and methods of extraction from tissue and body fluids are discussed at length. The liberation of histamine in different laboratory animals and the theories on the liberation of histamine in the human being are dealt with adequately. Histamine formation, destruction, and excretion are treated at length. A chapter on antihistaminic activity and another discussing sensitization diseases in relation to histamine and antihistaminics are excellent.

This monograph is particularly recommended to all allergists and immunologists.

—V. E. Friedewald, M. D., Big Spring.

The Relief of Symptoms

WALTER MODELL, M.D., F.A.C.P., *Associate Professor, Clinical Pharmacology, Cornell University Medical College. 450 pages. Philadelphia, W. B. Saunders Company, 1955.*

This is an easily read, repetitious book which devotes the first five chapters and the preface to the theory of need for relief of symptoms, which bring all patients to the doctor. "A scientific approach to medicine is no way inconsistent with an active concern over symptoms" is the author's justification for stressing treatment of all symptoms instead of treating the disease per se.

Part 2 is composed of 24 chapters of separate and distinct symptoms, including pain, anxiety, insomnia, gas, constipation, diarrhea, cough, fever, weakness and fatigue, nausea and vomiting, and jaundice. These are discussed with evaluation of numerous drugs used to relieve these symptoms.

The third part of the book is as an appendix, under the heading of "Counsel," which condemns the use of cortisone and ACTH except in the incurable diseases or an acute disease which is in the terminal stage with no other hope of reversing the fatal outcome.

This book is interesting reading, but especially recommended for the medical student in his last two years, interns, residents, or the young practitioner.

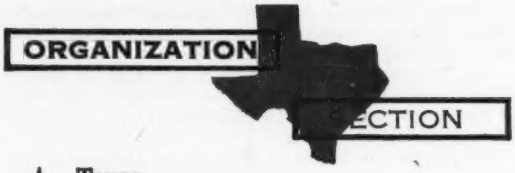
—Herbert H. Duke, M. D., Baytown.

Hernia

CHESTER B. MCVAY, M. D., Ph.D., *Clinical Professor of Surgery and Associate Professor of Anatomy, University of South Dakota School of Medical Sciences; Surgeon, Yankton Clinic, Yankton, S. D. 40 pages. $4.75. Springfield, Ill., Charles C Thomas, 1954.*

No Smoking: A Sign of the Times

ROBERT P. INGRAHAM. *58 pages. $2. San Antonio, The Naylor Company, 1955.*



★ Texas
Medical Association

Medicare Program Now In Force in Texas

Representatives of the Texas Medical Association and the Department of Defense reached an agreement in mid-December and a contract has been signed putting into effect the Medicare program for dependents of military personnel. The program in Texas is retroactive to December 7, when the national law became effective. Members of the Association have received through the mail details of the program and procedures to be followed under it.

When Congress passed Public Law 569 early in 1956, it set the wheels rolling on a plan to offer 2,000,000 dependents of military personnel medical and hospital care at government expense, much of it by private physicians and civilian hospitals, and $41,000,000 was earmarked to operate the program through June 30, 1957.

The House of Delegates of the Texas Medical Association, meeting in special session in Austin on September 9, while disclaiming approval of the legislation, voted to enter into an agreement with the Department of Defense to take part in the program for a period of up to one year and authorized the Board of Trustees to act as the negotiating agent. After consultation with the Council on Medical Economics and preparation of a tentative schedule of allowable maximum fees based on a statewide fee survey last summer and on the advice of officers of 32 specialty groups, the Trustees entered into a discussion with the Department of Defense that extended over a period of a month. The Trustees urged careful consideration of the proposed fee schedule, the request of the Texas Medical Association that Blue Shield of Texas be the fiscal administrator for medical payments, and the desire of hospitals that Blue Cross might be designated as their fiscal administrator. Before Texas signed a contract, among the last of the states to do so, a fee schedule which the Trustees consider satisfactory was agreed to and Blue Shield was named as fiscal administrator for payments to physicians; Blue Cross was not approved as fiscal administrator for the hospitals, Mutual of Omaha being named instead.

A doctor who wishes to accept patients under the Medicare program (and participation is voluntary) may identify eligible military dependents by their post exchange card, combined post exchange-commissary-military care card, or standard military dependent identification card. After July 1, a special Medicare card will be the only identification allowed. A statement for professional services reported on D.A. Form 1863 (supplies have been mailed to doctors and additional copies may be obtained from Blue Shield) should be sent in duplicate, with a third copy being retained in the doctor's office, to Military Medicare Section, Blue Shield, 2208 Main Street, Dallas. These instructions apply to all service under the program given on or since December 7.

Blue Shield will process all claims for the doctor, make payment to him, and be reimbursed by the Department of Defense. Blue Shield is serving in this capacity with no compensation other than the actual cost of administration, which will be paid by the government.

Medicare is designed to pay the physician his customary fee within the prevailing fee structure of his community or the fee allowed on the schedule agreed to for the Texas Medical Association, whichever is smaller. It is expected that such payment will cover the entire professional charge; should the physician believe that a greater allowance is justified, he may submit a special report for forwarding to the government, but he is not supposed to submit an additional bill to his patient.

Among the types of service which eligible dependents may obtain through the government program from private physicians are care of acute medical conditions, surgical conditions, contagious diseases while the patient is in the hospital, acute injuries and emergencies, obstetrical and maternity care, and diagnostic tests and procedures during hospitalization. There is no authorization for payments for drugs, medicinals, or other medical supplies except those furnished during hospitalization or administered directly by a physician. Semiprivate accommodations in a hospital up to 365 days for each admission are allowed. For hospital service, the patient will pay the first $25 or $1.75 per day, whichever is larger, and if the physician considers that a private room or private duty nursing care is required, a portion of the cost will be assessed against the patient. There are certain other restrictions and special allowances that the physician should note in the manual he has received.

Highlights of Annual Session Section and Specialty Programs

This month tentative programs are being completed for the nine scientific sections of the Texas Medical Association and the various specialty societies meeting during the annual session next spring in Dallas. Guest speakers, symposiums, and panel discussions are considered by the officers planning the programs as the highlights of most of them.

All of the scientific sections meet on Monday and Tuesday afternoons, April 29-30, whereas the specialty society meeting times vary, beginning on Saturday, April 27. Sessions of the societies are open to all members of the Texas Medical Association.

The Section on General Practice is featuring several guest speakers: Dr. George J. Thomas, who will speak on "Fire and Explosive Hazards in Hospitals and Their Control"; Dr. John R. Hill, "Abscesses and Sinuses in the Anorectal Region: Differential Diagnosis and Treatment"; Dr. Robert W. Virtue, "Emergencies in Anesthesia: Let's Stress Prevention"; and Dr. A. D. Ruedemann, Sr., "Some Ophthalmic Conditions of Interest to General Practitioners and Pediatricians."

Emphasis of the Section on Internal Medicine program will be on nontuberculous pulmonary disease. A panel discussion will be presented on the topic, with the section's guest, Dr. John Hickam from Durham, N. C., an authority on the subject, participating along with several distinguished Texas physicians.

An innovation on the Section on Surgery program will be round-table discussions each afternoon with guest speakers and outstanding Texas surgeons presenting broad surgical topics. Several guest speakers will present current material on pertinent subjects, the officers point out.

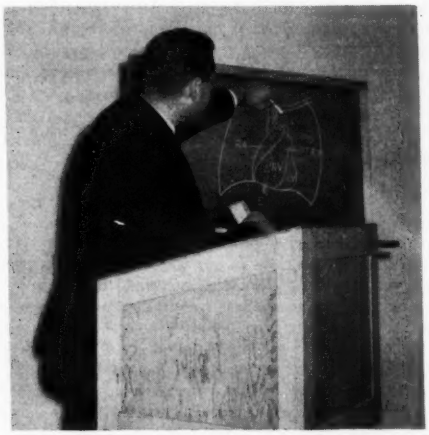
The guest of the Section on Obstetrics and Gynecology, Dr. Roger B. Scott of Cleveland, will participate in the section's panel discussions on "Bleeding in the First Trimester of Pregnancy" and "Carcinoma of the Cervix."

Dr. Arthur C. Jones of Boise, Idaho, will be the feature speaker on the Monday afternoon session of the Section on Eye, Ear, Nose, and Throat, which will be devoted to ear, nose, and throat topics. For the first time, a full day of eye

subjects will be presented on Tuesday in collaboration with the Texas Ophthalmological Association. Dr. Hugh L. Ormsby, a Toronto ophthalmologist, will speak, as will Dr. Ruedemann of Detroit. Dr. Ruedemann will bring out the relationships between ophthalmologists and optometrists.

The Section on Radiology program will be divided into diagnostic and therapy sessions, with Dr. Richard H. Chamberlain of Philadelphia as the key speaker. His talk for the section is on "Achievements and Deficiencies in the Management of Thyrotoxicosis with Radioactive Iodine."

Following a joint luncheon with the Texas Geriatrics Society, at which Dr. H. B. Mulholland of Charlottesville, Va., will discuss "Medical Aspects of Aging and Long-Term Illness," the Section on Public Health will meet Tuesday afternoon and will hear a talk by Dr. Wilson G. Smillie of New York. A dinner session has been planned for Sunday evening by the Texas Chapter of the American Association of Public Health Physicians, with Dr. Smillie as guest. The group's officers report that in true Texas tradition, the 46 Texas members compose the largest state chapter in the nation. Dr. Smillie, a joint guest of the Section on Public Health and the Conference of City and County Health Officers, also will address those attending the conference on Monday afternoon, as will Dr. C. A. Pigford of Lubbock, Dr. Robert E. Engles of Austin, and Dr. Fred K. Laurentz of Houston.



Guest speakers from throughout the nation will spark the various parts of the program for the Texas Medical Association annual session in Dallas. Guests will participate in more than 20 scientific section and specialty society meetings, as well as general meetings and refresher courses.

Television microscopy is planned as the feature of the Section on Clinical Pathology program, and two special speakers are of particular interest, the officers point out. Dr. John R. Schenken of Omaha, a guest jointly of the section and the Texas Division of the American Cancer Society, will discuss tumors of the salivary gland; and Dr. Howard C. Hopps, who recently has become associated with the University of Texas Medical Branch, Galveston, will speak on the pathogenesis of hepatic cirrhosis. Following the section meeting, the Texas Society of Pathologists will hold a brief business session.

A symposium on accidents and poisonings in children will highlight the Section on Pediatrics session with the Texas Chapter of the American Academy of Pediatrics cooperating. Pediatricians also will hear talks by Dr. Reynold A. Jensen of Minneapolis and Dr. Wolf Zuelzer of Detroit. Of special significance is the fact that the Texas Pediatric Society is jointly sponsoring one of these guests with the Texas Neuropsychiatric Association.

Dr. Thomas H. Burford, professor of surgery at Washington University School of Medicine, St. Louis, is the guest of the Texas Chapter, American College of Chest Physicians. He will talk on surgical diseases of the chest in children.

The head of the Section on Dermatology and Syphilology at Mayo Clinic, Rochester, Minn., Dr. Louis A. Brunsting, will discuss "The Use and Misuse of Steroids in Dermatology" for the Texas Dermatological Society.

The Texas Diabetes Association will present a one day session with a luncheon panel covering up-to-date concepts of the physiology and treatment of diabetes and its complications, designed for the general practitioner and specialist alike. The president of the American Diabetes Association, Dr. Frederick W. Williams of New York, will be the principal speaker.

The American Medical Association's Committee on Aging will sponsor a regional conference on aging in Dallas on Saturday and Sunday prior to the meeting of the Texas Geriatrics Society on Tuesday. The society's guest, Dr. Mulholland, is chairman of this committee and called the meeting, which is expected to attract about 50 physicians from the southwest territory interested in the problems of aging.

The Texas Heart Association will have as its principal speaker, Dr. Laurence B. Ellis, associate clinical professor of medicine at Harvard Medical School, Boston.

A field trip to Chance Vought Aircraft Division of the United Aircraft Corporation in the Dallas area to inspect the various health hazards and processes used will highlight the meeting of the Texas Industrial Medical Association, and buses will take the doctors on this conducted tour.

Dr. D. Ewen Cameron of Montreal, Canada, will discuss the modern department of psychiatry in the general hospital for the Texas Neuropsychiatric Association, and several other guests will participate in the program.

Scientific papers, including a talk by H. Relton McCarroll of St. Louis, will be given at a Monday morning session of the Texas Orthopedic Association. Luncheon and a business session will be followed by presentation of cases and a panel discussion at Southwestern Medical School of the University of Texas, with the panel moderated by Dr. Charles C. Gregory, Dallas.

Aspects of hypothermic techniques as they apply to open heart surgery and to neurosurgery will be discussed by the guest of the Texas Society of Anesthesiologists, Dr. Robert W. Virtue of Denver. It will include physiological considerations of congenital heart disease problems which are candidates for anesthesia and surgery.

Another member of the Mayo Clinic staff, Dr. John R. Hill, will discuss ulceration of the terminal portion of the colon for the Texas Society of Gastroenterologists and Proctologists.

"The Care of Patients with Multiple Injuries" by Dr. Preston A. Wade of New York will be presented for the Texas Traumatic Surgical Society on Sunday afternoon. The society also will have a cocktail reception featuring informal round-table discussions on professional subjects and for the doctors' wives on nonprofessional subjects.

Also meeting in Dallas in conjunction with the annual session are the Society of Life Insurance Medical Directors of Texas, which will have its annual business meeting with an election of officers at a luncheon on Tuesday; the Fourth District of the Texas Chapter of the American College of Surgeons on Saturday, which is composed of an afternoon scientific session (any fellow of the American College of Surgeons and his guests are invited) and an evening session of cocktails and dinner for the doctors and their wives; the Texas Air-Medics Association; and the Texas Society of Plastic Surgeons.

Alumni, Fraternity Groups Plan Dallas Meetings

Alumni associations and medical fraternities will meet during the 1957 annual session of the Texas Medical Association in Dallas; alumni meetings will begin at 6:30 p. m. Monday, April 29, and fraternity parties will be held from 6 until 8 p. m. Tuesday, thus allowing participants to attend the President's party the same evening.

The University of Tennessee Alumni of Texas have planned a banquet, to be preceded by cocktails; a discussion of new developments at the University of Tennessee College of Medicine, including the showing of slides of new buildings and equipment there; a business meeting; and a brief address by F. June Montgomery, executive secretary of the Memphis center alumni.

University of Texas Medical Branch alumni will be treated to a special performance of the floor show from the Statler-Hilton Hotel; no other specific program has been planned as yet.

A complete list of groups meeting with the Texas Medical Association will be published in the March issue of the *Journal*.

Committee Meetings Scheduled For Executive Council Week End

Included in the activities of the January 25-27 Executive Council week end will be meetings of numerous boards, councils, and committees of the Texas Medical Association. Unless otherwise indicated, the meetings will be held in the Association's headquarters building, 1801 North Lamar Boulevard, Austin. The following had been scheduled by publication deadline:

FRIDAY, JANUARY 25

8:00 p. m.—Committee on Public Relations.
6:00 p. m.—Board of Trustees.

SATURDAY, JANUARY, 26

8:30 a. m.—Council on Medical Jurisprudence.
9:00 a. m.—Committee on Bracero Insurance.
10:30 a. m.—Council on Medical Defense.
1:00 p. m.—Council on Medical Education and Hospitals.
1:00 p. m.—Committee on Blood Banks.
1:30 p. m.—Committee to Study Liaison with the State Bar of Texas (to meet in headquarters building of the State Bar, 201 W. 15).
2:00 p. m.—Board of Councilors.
2:00 p. m.—Council on Medical Economics.
2:00 p. m.—Committee on Mental Health.
2:00 p. m.—Committee on Problems of the Aging.
2:00 p. m.—Committee on School-Physician Relationships.
2:00 p. m.—Committee on Tuberculosis.
2:15 p. m.—Committee on Cardiovascular Disease.
7:30 p. m.—Committee on National Emergency Medical Service.
7:30 p. m.—Committee on Public Health.
8:00 p. m.—Committee on Scientific Exhibits.
8:00 p. m.—Committee on Cancer (to meet at Driskill Hotel).
8:00 p. m.—Committee on Rural Health and Doctor Distribution.

SUNDAY, JANUARY 27

7:00 a. m.—AMA Delegates (to meet at Driskill Hotel).
9:00 a. m.—Committee to Study Liaison with the State Bar of Texas.

The Council on Scientific Work was to meet January 13.

Other events to be held during the week end are the first indoctrination program for new members; the Conference of County Medical Society Officials and Symposium on Legislation, including as guest speakers C. Joseph Stetler of Chicago, the Hon. Olin Teague of Bryan, and Mrs. Mary D. Cain of Summit, Miss.; and a special ceremony for the Memorial Library. Detailed programs were in the December *Journal*.

The Executive Council will be in session on Sunday morning, January 27.

COMMITTEE CHANGES ANNOUNCED

Additional changes in the committee list of the Texas Medical Association have taken place as follows:

Dr. William M. Crawford, Fort Worth, resigned as chairman and a member of the Committee on Public Relations, November 12, 1956.

Dr. Elliott Mendenhall, Dallas, was named November 30, 1956, as an Appointee to the Advisory Committee to Texas State Hospitals and Special Schools, his special interest being in tuberculosis.

Dr. Tom Bond, Fort Worth, has been made chairman of the Committee to Study Health Costs. Dr. Russell L. Deter, El Paso, was named December 26, 1956, to the vacancy on the committee caused by the resignation from the committee of the former chairman, Dr. Marvin C. Overton, Jr., Pampa.

★ County Societies

School-Physician Relations Studied

Areas of discontent and misunderstanding are the product of the failure of medical and school men to confer, Dr. Jay J. Johns, Taylor, told members of *Williamson County Medical Society* and guests at a November meeting. Dr. Johns is chairman of the Texas Medical Association's Committee on School-Physician Relationships.

Representatives from 11 surrounding towns were present, and they included school administrators, doctors, education board members, physical training directors, members of the county health unit, nurses, and members of the Parent-Teacher Association. A panel of doctors and educators discussed several aspects of school health including immunizations, athletic programs, first aid courses, body mechanics needs, lunch programs, mental health, and special helps for exceptional children.

Poison Control Center Established

A center to provide the medical profession with information about product composition and antidote measures for cases of accidental poisoning opened January 2 in the Brackenridge Hospital Emergency Room, Austin, under sponsorship of the Austin Poison Control group, members of which come from the medical, chemical, pharmacy, nursing, hospital, medical assistants, and related fields. The Travis County Medical Society has approved the project, the services of which will be available only to physicians.

Eventually a card file giving information on household

products and drugs will be included in the center; at first a collection of textbooks will provide information on approximately 2,500 common drugs and household products. If the physician wishes, information not on file will be obtained by telephone by center personnel, the cost being borne by the patient. Materials and equipment for therapeutic measures will be available in the emergency room, and interns and nurses will be trained to assist in the use of the information file and equipment. Certain toxicological analyses are being developed in the hospital laboratory, and the facilities of the Department of Public Safety and the Department of Public Health will be available if required.

The Poison Control Group meets monthly and is open to interested physicians. It hopes to carry on a public educational program to alert parents to the toxic dangers of common household products.

Police Ask Help In Identifying Conditions

The chief of the Fort Worth police department recently asked members of the *Tarrant County Medical Society* to help train members of the police force in differentiating between alcoholic intoxication, epileptic convulsions, diabetic coma, and vascular accident. It was suggested that a tape recording be made giving various characteristics of each condition, and other ideas for presentation of this material were requested.

Doctors Help Plan Sewage Disposal

A committee of the *Tom Green-Eight County Medical Society* has been appointed to study the possibilities of obtaining a complete sewage disposal unit for the city of San Angelo. It was felt by some that the method of disposal being contemplated by the city commission might become a public health menace in the event of any unusually heavy rainfall in the area. The committee, which consists of six physicians who have had experience in sewage disposal problems, was to give the matter careful study and make concrete recommendations to the city commission as to a type of unit which would be safe under the most possible conditions.

Programs

Recent county society programs have included:

Bexar County Society.—"Medical Hypnosis," Dr. Neville Murray, San Antonio.

Brazoria County Society.—"True Group Insurance Plan," Reed Giese, Austin.

Cameron-Willacy Counties Society.—"Medical Economics Problems and the Business Side of Medical Practice," Dr. Everett C. Fox, Dallas; and "The Private Practice of Medicine and Its Future," C. Lincoln Williston, Austin.

Hardeman-Cottle-Foard-Motley Counties Society.—"Surgical Aspects of Peptic Ulcer," Dr. Samuel G. Dunn, Lubbock.

Hill County Society.—"Ectopic and Extra-Uterine Pregnancies," Dr. Malcolm MacRae, Waco.

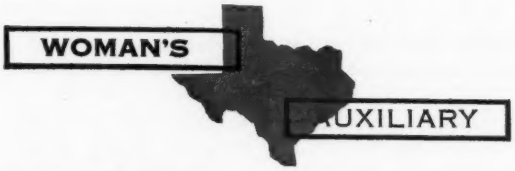
Tarrant County Society.—"Hydatidiform Mole," panel discussion, Drs. Dalton C. Hartnett, James G. Stouffer, O. J. Wollenman, and T. U. Taylor, all of Fort Worth; "Aspects of Endocrinology," Dr. Dewey Johnston, Fort Worth; "The Chronically Discharging Ear," Dr. William C. Hendrix, Fort Worth; and "Review of Legislation," Senator Doyle Willis and Representatives Jim Moore and Howard Green, all of Fort Worth.

Tom Green-Eight County Society.—"Clinical Diagnosis of Vascular Diseases and Surgical Aspects of Treatment," Drs. Robert Franken and Raymond G. Boster, San Angelo; "Diabetic Uropathies," Dr. Albert B. Peyton, San Angelo.

★ American Medical Association

Film Shows Presentation of Medical Testimony

"The Medical Witness," the first in a series of educational films dealing with the professional relationships of doctors and lawyers, depicts the right and wrong methods of presenting medical testimony by reenacting the trial of a personal injury case. It will be shown at the Texas Medical Association Memorial Library January 26 during the Symposium on Legislation and Conference of County Society Officials. This film, prepared jointly by the American Bar Association and the American Medical Association, is available through the AMA.



Science Fairs Evolve From Youngsters' Disinterest

Why should the medical profession exert itself in the field of education by promoting science fairs?

A well known radio and television news commentator questioned high school students in a southwestern metropolitan community about their plans for the future. His wrath was righteous in reporting his findings. The majority expressed desire for wealth by the quickest and easiest means. Their attitude toward science was one of disdain. Scientists and scholars were "squares" who went around in "smelly sweat shirts and tennis shoes" and had no knowledge of or interest in clothes and fast cars. All in all the comments of the group were frightening if one thinks of the future.

Reports such as this, along with statistics proving how many high schools had neither physics nor chemistry courses, and how the number of science and engineering graduates had decreased, gave rise to a demand for action to dramatize scientific pursuits and attract more youngsters at the lower levels of learning. Big industry went to work, and showmanship which would have done justice to P. T. Barnum glorified the secrets of science. Handsome young college

Officers of the Woman's Auxiliary to the Texas Medical Association for 1956-1957: President, Mrs. Richard C. Bellamy, Liberty; President-Elect, Mrs. H. S. Renshaw, Fort Worth; First Vice-President, Mrs. Harold Lindley, Pecos; Second Vice-President, Mrs. Ramsay H. Moore, Dallas; Third Vice-President, Mrs. William D. Nicholson, Freeport; Fourth Vice-President, Mrs. Lynn Hilbun, Henderson; Fifth Vice-President, Mrs. R. B. G. Cowper, Big Spring; Treasurer, Mrs. William C. Barksdale, Borger; Recording Secretary, Mrs. J. L. Jinkins, Galveston; Corresponding Secretary, Mrs. E. R. Richter, Dayton; Publicity Secretary, Mrs. Joe Thorne Gilbert, Austin; Parliamentarian, Mrs. John C. Parsons, San Antonio; Executive Secretary, Miss Hazel Casler, Austin.

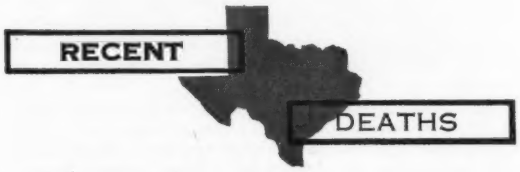
boys toured with some shows and their spell held the magic of Merlin. "Mr. Wizard," a popular television show for grade school students is another excellent step toward removing the veil of mystery from everyday phenomena.

The science fair is a natural result. For generations the fair has represented a goal toward which one worked, whether one's interest was in crocheting antimacassars or showing a fine horse. The desire to win and move on to the district contest made it exciting, regardless of the fact that the tangible reward was nothing more than an embossed blue ribbon.

Now, the doctor, chemist, botanist, and others interested in the progress of science have joined forces to support and applaud the efforts of the student with the initiative to delve into science related fields. The Texas and American Medical Associations have given official sanction to science fairs, which the Woman's Auxiliary has adopted as a project. Mrs. Hal Norgaard, Denton, is chairman of the state Committee on Science Fairs, and at the local level, woman's auxiliaries have offered assistance as sponsors, provided citations for exhibits, arranged radio and television interviews for students, and made provisions for winners to attend larger fairs.

Local fairs in Texas are scheduled for February and winners will compete on a regional or district level in March. It is estimated that 340 contestants will enter the National Science Fair in Los Angeles in May. Sponsored by the Science Clubs of America, this fair will present awards worth $2,500.

Growing interest in the science fairs indicates that the long-range dividends from a minimum investment of time and money on the part of medical societies and auxiliaries will prove to be far beyond expectations.



DR. CHARLES McCALLUM

Dr. Charles McCallum, Mesquite, Texas, died November 22, 1956, of cancer and a stroke.

Son of Mr. and Mrs. John Tom McCallum, he was born December 28, 1875, in Pleasant Valley, and attended preliminary schools there. Later, he attended the Patterson Institute, Hillsboro, before entering the Memphis Hospital Medical College, Memphis, Tenn., from which he was graduated in 1905. He began his medical practice in the Oklahoma Indian Territory, and worked in Oakland, Randlett, and Quapaw from 1905 until 1935, when he moved to Texas to practice in Royse City. He remained there two years before moving to Mesquite, where he continued his medical practice until his health forced him into semiretirement about three years ago.

Dr. McCallum was a member of the Texas and American Medical Associations through the Dallas County Medical Society, and was elected to honorary membership in the state organization in 1951. He also had been presented a Golden "T" from the University of Tennessee for having been in medical practice 50 years. During World War II, he received awards from Presidents Roosevelt and Truman for his service as medical examiner for draftees and volunteers in his area. Dr. McCallum was a sports enthusiast, and usually served as team doctor for athletic squads wherever he practiced. He also was a member of the Masonic Lodge, Woodmen of the World, Kiwanis and Lions Clubs, and the Presbyterian Church.

DR. CHARLES McCALLUM

The former Miss Nealy Van Pelt and Dr. McCallum were married March 11, 1906, near Madill, Okla., which was then Indian Territory. In addition to their own children, Dr. and Mrs. McCallum reared two nieces and a grandson, and gave educational help to several other young people at various times.

Survivors include Mrs. McCallum; three sons, Ralph A. McCallum, Bismarck, N. D.; Charles Ray McCallum, Los Angeles; and Orlean D. McCallum, Houston; four brothers, Joe and Mack McCallum, both of Dallas; and Gee and John Tom McCallum, both of Garland; a sister, Mrs. Millard Flook, Garland; six grandchildren; and three great-grandsons.

DR. CHARLES W. THORNTON

Dr. Charles William Thornton, who practiced in Dallas, Texas, for almost 40 years, died November 4, 1956, of a heart attack in Hobbs, N. Mex., where he had lived in the home of his daughter for the past two years.

Born January 7, 1874, in Nevada, Mo., he was the son of Reuben T. and Myra (Putnam) Thornton. Dr. Thornton obtained his doctor of medicine degree in 1893 at the Beaumont Hospital Medical College in St. Louis. He did postgraduate work in New York and Chicago before opening his practice in Deerfield, Mo. After a time he moved to the Texas Panhandle, filing a claim on state land where Dalhart is now. He laid out the townsite and gave the city its name. He moved to Dallas in 1915 and was active in practice there until poor health forced his retirement two years ago.

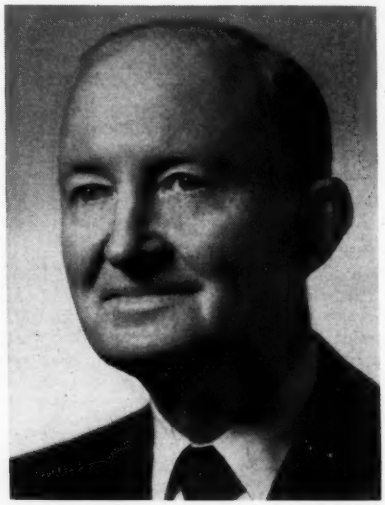
During his residence in the Dalhart area, Dr. Thornton was local surgeon for the Fort Worth and Denver Railway and president of the local county medical society. In Dallas, he was a member of the Dallas County Medical Society, Texas Medical Association, and American Medical Association, being elected to honorary membership in the state association in 1952.

Dr. Thornton was married in Georgetown to the former Miss Mamie Cluck. She survives, as does his daughter, Mrs. Bob Wilson, Hobbs, N. Mex.; and two nieces.

DR. CHARLES D. FRANKLOW

Dr. Charles Davis Franklow, Dallas, Texas, died November 8, 1956, in a local hospital of coronary occlusion.

The son of Mr. and Mrs. J. H. Franklow, Dr. Franklow was born February 15, 1891, in Shiro, Grimes County, where he received his early education. He then attended Texas Christian University and old Fort Worth Medical College, receiving degrees in pharmacy and medicine in 1911 and 1915, respectively. Some 15 years later he did special work in Vienna. Dr. Franklow opened his practice in Shiro, then moved to Pilot Point, and finally settled in 1926 in Dallas, where he was director of the Medical Arts Laboratory.



DR. CHARLES D. FRANKLOW

Dr. Franklow belonged to the Dallas County Medical Society, Texas Medical Association, American Medical Association, Chamber of Commerce, Scottish Rite Masonic Order and Shrine, and Brook Hollow Golf Club. As a first lieutenant with the Army Medical Corps he was overseas 13 months during and immediately following World War I.

Miss Marion Cuthrell and Dr. Franklow were married June 6, 1916, at Navasota. Mrs. Franklow and two sisters, Mrs. E. T. Yates, Brownsville, and Mrs. Roland Schulze, Pleasanton, survive.

DR. HENRY STANFORD

Dr. Henry Stanford, Galveston, Texas, died November 7, 1956, of a myocardial infarction.

He was born July 22, 1917, in Taylor, and his parents were the Rev. and Mrs. Henry Stanford. After his graduation from Mount Vernon High School, Dr. Stanford earned his bachelor of science degree from Southern Methodist University, Dallas, and was graduated from the University of Texas Medical Branch, Galveston, in 1941. He interned at the King's Daughters Hospital, Temple, and spent one year in surgical residency at the Harris Clinic, Fort Worth. During World War II, Dr. Stanford served as a captain aboard the Army hospital ship, USS Algonquin. In 1947, he began his private practice in Mount Vernon; he remained there until shortly before his death, when he moved to Galveston.

DR. HENRY STANFORD

Dr. Stanford was a member of the Texas and American Medical Associations throughout his career through the Tarrant, Taylor-Jones, Hopkins-Franklin, or Camp-Morris-Titus Counties Medical Societies. He served as secretary of the Hopkins-Franklin group in 1948 and as its president in 1950. He also maintained membership in the Southwestern Surgical Congress, Texas and American Academies of General Practice, Masonic Lodge, Methodist Church, and Theta Kappa Psi medical fraternity. Interested in medical education, Dr. Stanford had a part in planning the preceptorship program now in effect at the University of Texas Medical Branch, and he was one of the first 35 preceptors to be named.

Miss Emily Evans and Dr. Stanford were married April 5, 1941, in Galveston. Mrs. Stanford survives, as do three children, Emily Jean, Mary Grace, and Faith Marie, all of Galveston; his mother, Mrs. S. M. Williams, Mount Vernon; and his mother-in-law, Mrs. W. L. Evans, who made her home with his family.

DR. HARRY B. JABLOW

Dr. Harry B. Jablow, Dallas, Texas, died September 23, 1956, in a local hospital.

He was born in Campbellsville, Ky., in 1888, and attended public schools in Louisville. He received his doctor of medicine degree from the University of Louisville School of Medicine in 1911, and interned one year at the United States Marine Hospital, Chicago. He then spent two years as a physician in the Contagious Diseases Hospital, Chicago, and as superintendent of the City Emergency Hospital, Chicago. In 1913, Dr. Jablow moved with his parents, the late Mr. and Mrs. Isaac Jablow, to Dallas, and began his private practice of medicine shortly afterwards, specializing in internal medicine. He was one of the first Dallas doctors to join the armed forces in World War I, and served on a Navy troop transport ship.

Dr. Jablow was a member of the Texas and American Medical Associations through the Dallas County Medical Society, and also was a member of the Temple Emanu-El.

Miss Mildred Bass and Dr. Jablow were married in 1943. Mrs. Jablow survives, as do two sisters, Mrs. Henry S. Miller, Sr., and Mrs. Leon Lichtenstein, both of Dallas.

DR. ROY GOGGANS

Dr. Roy Goggans, Dallas, Texas, died after a six weeks illness November 4, 1956, in a local hospital.

A native of Aquilla and the son of James B. and Caledonia Goggans, Dr. Goggans was born July 25, 1889. He attended public schools in Aquilla and Sam Houston State Normal School, Huntsville, before entering the Memphis Medical School and later Vanderbilt University School of Medicine, from which he received his medical degree in 1912. He served an internship at St. Joseph Hospital, Memphis, Tenn., then returned to Texas to begin practice in Chilton. He served on the staff of the state tuberculosis hospital near San Angelo before going in 1922 to Dallas,

DR. ROY GOGGANS

where he was superintendent of Woodlawn (tuberculosis) Hospital for 25 years. He retired temporarily in 1947 before becoming head of the Dallas Tuberculosis Control Center the next January, a position which he held for nine years.

Dr. Goggans was a member of the Dallas County Medical Society, Texas Medical Association, American Medical Association, Dallas County Tuberculosis Association, Texas Tuberculosis Association, American Trudeau Society, Masonic Lodge, and Methodist Church.

He and Miss Velma Read were married November 10, 1951, in Oklahoma City.

He is survived by his wife; a brother, Fred Goggans, Hillsboro; and a nephew.

DR. FOSTER D. SIMS

Dr. Foster D. Sims, Waco, Texas, died at his home October 10 of angina.

He was born October 7, 1876, in Falls County, and was the only child of Volney H. and Carrie (Foster) Sims. He attended public schools in Hill County and the University of Texas, Austin, and was graduated from the University of Texas Medical Branch, Galveston, in 1904. He practiced in Menlow for four years before moving in 1909 to Abbott, where he remained until 1942. At that time, Dr. Sims became associated with the Rusk State Hospital. About nine years ago he retired and had lived in Waco since then.

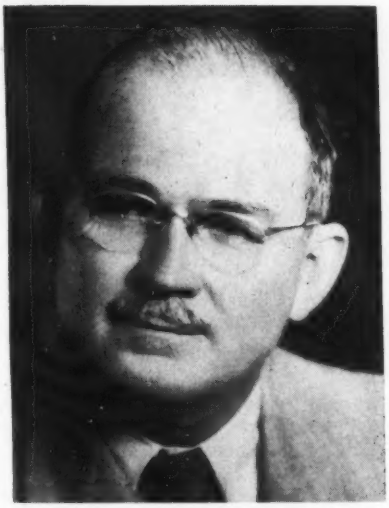
Dr. Sims maintained his membership in the Texas Medical Association and the American Medical Association through the Hill County Medical Society throughout his career, and served three terms as president of his county society. In 1951, he was elected to honorary membership in the state organization.

Miss Eunice May Swofford and Dr. Sims were married January 1, 1905, in Paint Rock. Mrs. Sims survives.

DR. THOMAS L. DENSON

Dr. Thomas Leland Denson, Cameron, Texas, died October 13, 1956, of the last of a series of heart attacks that had been troubling him for five years.

Dr. Denson was born March 3, 1901, at Maysfield, where he finished high school. He then was graduated from Baylor University, Waco, and the University of Texas School of Medicine, Galveston, obtaining his medical degree in 1929. He interned at King's Daughters Hospital, Temple, and did postgraduate work at Cook County Graduate School of Medicine, Chicago. After a short residency in Temple, he began practice in Cranfills Gap, moving shortly thereafter to Cameron. There he became associated with his father, Dr. John Denson, and his uncle, Dr. Tom Denson, to organize the Denson Clinic.



DR. THOMAS L. DENSON

A member of the Texas and American Medical Associations throughout his career, Dr. Denson belonged successively to the Bell, Bosque, and Milam County Medical Societies. He was secretary and then president of the Milam County Society for several terms. He also was a member of the Texas and American Academies of General Practice. Dr. Denson was consulting and local surgeon for the Santa Fe and Southern Pacific railroads. He was a member of the Christian Church, a thirty-second degree Mason, and past master of the local Masonic Lodge. He was the first president of the Cameron Country Club after its reorganization following World War II. An enthusiastic and able left handed golfer, Dr. Denson had set the highest batting average in the Southwest Conference when he played on the Baylor University baseball team.

June 3, 1929, Dr. Denson and Miss Ann Ruth Johnson

were married in Giddings. She survives, as do a son, John Talley Denson, Austin; a daughter, Mrs. J. Dale Paschal, Houston; a brother, Lane Denson, Dallas; and two sisters, Mrs. Roy Baskin and Mrs. Eber Flinn, both of Cameron.

DR. JAMES A. HILL

Dr. James Abraham Hill, a Houston, Texas, surgeon who pioneered in thyroid surgery, died October 16, 1956, of carcinoma of the liver and colon at Alpine, where he had spent most of his time recently with a niece and a nephew.

The son of Dr. James Theophilus and Sarah Jane (Womack) Hill, Dr. Hill was born May 14, 1872, in Goliad. He attended Texas Agricultural and Mechanical College and the University of Texas School of Medicine, Galveston, before being graduated in medicine at Tulane University, New Orleans, in 1900. He practiced for nine years at Groveton, then moved to Houston, where he was active until about two years ago.

A member throughout his career of his county, state, and national medical organizations, Dr. Hill was councilor of the Eleventh District from 1907 to 1909 and of the Ninth District in 1910 and 1911. He was chairman of the Section on Gynecology and Obstetrics for the 1916 annual session of the Texas Medical Association, in which he was elected to honorary membership last spring. He had been president of Harris County Medical Society. A founder member of the American Goiter Association and vice-president of the organization in 1940, Dr. Hill had limited himself to surgery of the thyroid gland for the last 20 years of his practice and was said to have performed more thyroidectomies than any other living American at the time of his retirement. He was a founder fellow of the American College of Surgeons and its governor for Texas for a number of years. He also was a fellow of the International College of Surgeons and of the Southwestern Surgical Congress.

DR. JAMES A. HILL

Dr. Hill was professor emeritus of clinical surgery at Baylor University College of Medicine and at various times served as chief of surgery at Memorial, Jefferson Davis, and Methodist Hospitals and visiting surgeon at St. Joseph's, Hermann, and St. Luke's Hospitals, Houston. During World War I he was chief surgeon at Walter Reed Hospital, Washington, D. C. He was a member of the board of directors of the First City National Bank, Houston; member of the Bayou Club, Houston; former member of the Houston County Club; member of the Alpine Country Club; and a thirty-second degree Mason.

Miss Lila Barnes, Trinity, and Dr. Hill were married in 1903. She died in 1905. Dr. Hill married again in 1923; his second wife, the former Miss Fanetta Wortham, Houston, died in 1951. Dr. Hill is survived by two sisters, Mrs. D. C. Hill, Eldorado, and Mrs. R. H. Yarbrough, Amarillo, and the niece and nephew with whom he had been staying, Miss Miltia Hill and Dr. Malone V. Hill, Alpine.

DR. WALTER M. WARREN

Dr. Walter Marvin Warren, Center, Texas, died in a Galveston hospital on October 26, 1956, as a result of a cerebral hemorrhage suffered ten days earlier.

Dr. Warren was born February 2, 1887, in Shelby County; his parents were Charles Wesley and Addie (Riggs) Warren. After being graduated from Center High School, he received his degree in medicine at the University of Texas School of Medicine in 1915 and interned at John Sealy Hospital, Galveston. He then opened his practice in Center.

A member of the Texas and American Medical Associations through the Shelby-San Augustine-Sabine Counties Medical Society, Dr. Warren also was a member of the Tenth District Medical Society. He was examining physician for Selective Service for many years and received a certificate of appreciation for this service from the late President Franklin D. Roosevelt. He was a thirty-second degree Mason and a member of the Shrine.

Miss Marguerite Jane Crawford and Dr. Warren were married in Center on January 2, 1923. Survivors include Mrs. Warren; one son, Walter M. Warren, Jr., Shreveport; one daughter, Mrs. Travis R. O'Rear, and two grandchildren, Center; four sisters, Mrs. Effie Johnson, Albuquerque, N. Mex.; Mrs. Ella Webb, Center; Mrs. Rena Edison, Neville; and Mrs. Nettie Holton, Longview; six brothers, Dr. W. H. Warren, Jess Warren, and Lee Warren, all of Center; Arch Warren, San Antonio; McDuff Warren, Neville; and Ellis B. Warren, Houston.

DR. WALTER M. WARREN